

CHILDREN AND WOMEN IN TAMILNADU

**A SITUATION ANALYSIS
1990**



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COMMUNITY HEALTH CELL

A SITUATION ANALYSIS 1990

A STUDY CONDUCTED FOR GOVERNMENT OF TAMILNADU

By

A.F. Ferguson & Co., Madras

WITH SUPPORT FROM UNICEF

Acknowledgements

The UNICEF sponsored study on the "Situation Analysis of Children in Tamil Nadu" was commenced in 1989. This study was intended to be a base document for policy makers, planners and all other agencies and individuals involved and interested in the integrated development of children and women. This document has tried to cover various aspects that are relevant to children and women including health, nutrition and education. It also looks at environmental and demographic factors that affect children. Children in difficult circumstances as well as disabled and destitute children have also been included.

A.F. Ferguson & Co. in preparing this document has relied largely upon secondary data and discussions with various government and voluntary organisations who have all been very helpful in this regard. On completion of the first draft, discussions were also held with select representatives of the government and voluntary agencies. On the basis of these discussions this final version has been prepared. Grateful thanks are acknowledged to all officials and non-officials for their valuable contribution and assistance rendered for the study.

CONTENTS

	Page
FOREWORD	Page
1. Tamil Nadu—A Profile	
Physical Features	1
Demographic Characteristics	2
Birth and Death Rates	4
Social Conditions	9
Occupational Structure	10
Literacy	11
Languages	12
Economy	12
Primary Sector	13
Secondary Sector	15
Other Industries	16
2. Health Services in Tamilnadu	
Health Services	17
Health Expenditure	19
Medical Care Services	20
Mother and Child Health Care programmes(MCH)	23
Integrated Child Development Services (ICDS)	25
Tamil Nadu Integrated Nutrition Project (TINP)	28
Danida Assisted Health Care Project (Danida)	32
Tamil Nadu Government Nutritious Meal Program (TNGNMP)	33
Madras Urban Development Project (MUDP)	34
Family Welfare	34
Control of Diseases	36
Indian Medicine and Homeopathy	36
3. Health	
Under 5 Mortality Rate (U5MR)	40
Infant Mortality Rate (IMR)	40
Neo Natal Mortality	42
Still Birth Rate and Peri Natal Mortality	43
Prematurity and Low Birth Weight	46
Maternal Mortality Rate	49
Role of Traditional Birth Attendants (TBAS)	54
Universal Immunisation Programme	56
Cold Chain	61
Diarrhoea Management Programme	65

	Page
Acute Respiratory Infection (ARI) Control Programme	... 66
Vaccine Preventable Diseases	... 66
Other Major Diseases	... 70
Oral Health Status of Children	... 72
School Health Programme	... 73
4. Nutrition	
Causes of Malnutrition	... 74
Income Disparities and Nutritional Poverty	... 76
The Public Distribution System	... 76
Trends in Food Production and Availability	... 77
Survey of Dietary Intake in the State	... 80
Calorie and Nutrient Composition of Diets	... 82
Customs, Beliefs and Prejudices	... 83
Frequent Infestations and Infections	... 83
Nutritional Status of Children	... 86
Micro Nutrient Deficiencies	... 88
Nutrition Intervention Programmes in the state	... 91
Tamilnadu Government Nutritious Meal Program	... 91
Tamilnadu Integrated Nutrition Project (TINP)	... 94
Integrated Child Development Services	... 94
Growth Monitoring and its Impact on Nutritional Status of Children	... 97
Maternal Malnutrition and its Impact on Nutritional Status of Children	... 97
Breast Feeding and Weaning Practices	... 100
Vitamin A Deficiency and Blindness	... 102
Iron Deficiency	... 105
Iodine Deficiency	... 108
Communication	... 108
5. Education	
Literacy	... 110
Government Expenditure on Education	... 111
Pre-school Education	... 118
Primary Education	... 119
Education Enrolment	... 120
Drop Out Rates	... 122
Non-formal education	... 124
Quality of education	... 124
Reach of the education system	... 125

6. Child Labour	
Legislative Aspects	... 128
Causes of Child Labour	... 128
Nature of Child Labour	... 129
Magnitude of the Problem	... 129
Sectors in which Children Work	... 131
Conditions of Work of Children	... 136
Priority needs of Working Children	... 137
Government Policy on Child Labour	... 137
7. Disability, Destitution and Delinquency	
Disability	... 139
Prevalence Rates for Disability	... 139
Causes of Disability	... 140
Priority Needs of the Disabled Children	... 142
Services for the Disabled	... 143
Destitute Children	... 144
Services for the Destitute	... 145
Delinquent Children	... 147
Institutions under the Act	... 148
The Future Thrust	... 148
8. Environment	
Water	... 149
Sanitation	... 150
Housing	... 152
Urban Slums	... 152
Government Programmes	... 154
Pollution	... 156
Adulteration of Food Articles	... 156
Deforestation	... 157
9. Perspectives	... 158
Rural/Urban Distinctions	... 160
Environment	... 160
Child Labour	... 161
Disabled and Destitute Children	... 161
Conclusion	... 161
List of Tables	... 163
List of Exhibits	... 165

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D. O. No.

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FOREWORD

UNICEF has made a commendable effort in bringing out the Situation Analysis of Women and Children in Tamil Nadu, keeping in view the acute need for providing such a data base to policy makers, planners and implementors. This is a departure from earlier approach of providing country-wide analysis. The present report is more relevant, area specific and focussed on problems, needs and requirements of Tamil Nadu.

The development of a society can be measured by the status of its weakest members. The quality of the life of women and children is inter-linked, and is the most sensitive indicator of the progress of a given society. The study makes available analyses of the critical areas of health, nutrition, education and the overall environment of women and children. It also provides valuable insight into the problems of certain special categories of children such as the disabled, the destitute and the child worker. The issues relating to female children are also highlighted.

The infant mortality rate in Tamil Nadu has started declining steadily. It has come down from 74 in 1988 to 68 in 1989. However, infant deaths still constitute 18.3% of all deaths in Tamil Nadu. Out of the total infant deaths, 56.3% are neo-natal deaths. 25.2% of all deaths occur among the children below the age of 4 years. 13.4% of all deliveries result in still birth, while 48.9% of births are attended by untrained workers. Keeping above in view, Tamil Nadu has launched a massive Safe-Motherhood Programme.

We expect that the report would not only make district-wise data available, but also indicate clusters of backwardness and identify the priority areas, geographically. This would enable Government and N.G.Os to implement various aspects of the 'Safe-Motherhood Programme' comprising of raising the age of marriage, expanding female education, increasing deliveries by trained personnel, emphasising on the birth of healthy children, reducing I.M.R., universalising spacing and at a later stage adoption of permanent methods of contraception, and improving mother and child health care and nutrition.

It is also hoped that this study will focus on the need for an equitable balance in development planning and allocation of resources, to meet the basic needs of women and children.



(T.V. ANTONY)

MAJOR PROGRAMMES FOR CHILDREN AND WOMEN IN TAMILNADU

UIP	21 Districts	Madras City (DPH)
WIC Locations	9 Districts	South Arcot
		Salem
		Thanjavur
		Trichy
		Madurai
		Coimbatore
		Tirunelveli
		Vellore
 ICDS	 21 Districts	 Salem
DWCRA	12 Districts	Thanjavur
		Coimbatore
		Periyar
		Dharmapuri
		V Ambedkar
		T Sambuvarayar
		South Arcot
		N Kattabomman
		P T Thirumagan
		Pudukkottai
		Trichy
 UBSP	 17 Districts	 Chengai Anna
		North Arcot Ambedkar
		T V Sambuvarayar
		Madurai
		Coimbatore
		South Arcot
		Nilgiris
		Dharmapuri
		Dindigul-Quaid E Milleth
		Thanjavur
		P T Thirumagan
		Kanyakumari
		Pudukkottai
		Ramanathapuram
		N Kattabomman
		Chidambaranar
		Kamarajar

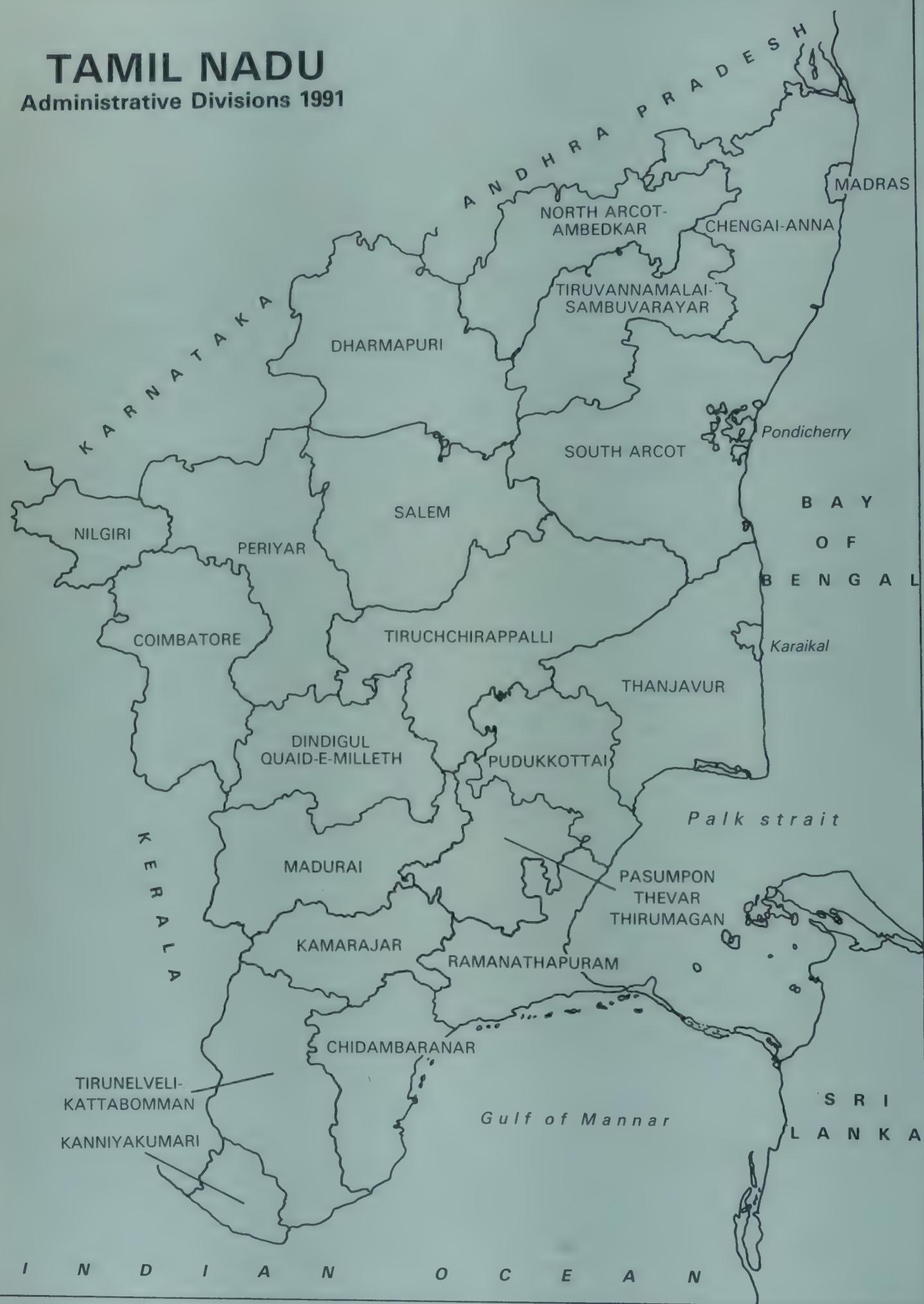
LEP	1 District	Chengai Anna
ARI	1 District	Ramanathapuram
Safe Motherhood Programme (TBAs)	2 Districts	North Arcot Ambedkar N Kattabomman
Iron Fortification of Salts Sanitation Drilling Operations	1 District 1 District 8 Districts	Ramanathapuram Periyar Salem Periyar N Kattabomman Madurai Trichy Dharmapuri North Arcot Vellore T V Sambuvarayar
Community Based Convergent Services for Children & Women	1 District	Periyar

EDUCATION

AIEP	1 District	Dharmapuri
PIED	1 District	Chengai Anna
ECE	1 District	Kamarajar

TAMIL NADU

Administrative Divisions 1991



POPULATION – DISTRICTWISE

STATE/DISTRICT	TOTAL POPULATION IN 1981	RANK	TOTAL POPULATION IN 1991	RANK
TAMIL NADU	48,408,077		55,638,318	
1. Madras	3,276,622	6	3,795,028	6
2. Chengai-Anna	3,616,508	3	4,620,967	2
3. North Arcot- Ambedkar	2,628,526	9	3,000,208	9
4. Dharmapuri	1,997,060	12	2,395,606	11
5. Tiruvannamalai- Sambuvarayar	1,785,798	13	1,997,458	13
6. South Arcot	4,201,869	1	4,870,871	1
7. Salem	3,441,717	5	3,914,239	5
8. Periyar	2,068,462	11	2,322,851	12
9. Nilgiri	630,169	21	704,827	21
10. Coimbatore	3,060,184	7	3,531,078	7
11. Dindigul- Quaid-e-Milleth	1,564,448	14	1,768,679	14
12. Tiruchchirappalli	3,612,320	4	4,114,323	4
13. Thanjavur	4,063,545	2	4,526,709	3
14. Pudukkottai	1,156,813	18	1,322,494	18
15. Pasumpon Thevar Thirumagan	972,186	20	1,074,989	20
16. Madurai	2,971,449	8	3,447,595	8
17. Kamarajar	1,340,907	17	1,554,350	16
18. Ramanathapuram	1,022,344	19	1,135,887	19
19. Chidambaranar	1,350,581	16	1,455,796	17
20. Tirunelveli- Kattabomman	2,223,170	10	2,493,189	10
21. Kanniakumari	1,423,399	15	1,591,174	15

1.

Tamil Nadu—A Profile

PHYSICAL FEATURES

- 1.1 Tamil Nadu (TN) lies in the southern most part of India. With an area of 1,30,000 sq.kms., it occupies approximately 4% of India's total area. As per the 1981 Census the state had 16 districts which upon subsequent reorganisation stand at 21 today.
- 1.2 The topography of Tamil Nadu consists of the coastal plains in the east with uplands and hills in the west. Hills in the western and northern portion of the state are the western and eastern ghats. The two major hill stations of Tamil Nadu—Ooty in the Nilgiris and Kodaikanal in the Palani ranges — are in the western ghats. The other important hilly areas are Jowadis (North Arcot), Shervaroys (Salem) and Kalrayans (South Arcot and Dharmapuri). The small tribal population of Tamil Nadu is found mostly in the Nilgiris and the above hilly areas.
- 1.3 The Cauvery Delta is the most fertile region of the state and along with the northern plains is the home of early settlements in Tamil Nadu.
- 1.4 Tamil Nadu has a long coastline of around 1000 kms. (nearly 18% of India's coastline). Madras and Tuticorin are the major ports.
- 1.5 Only 17% of Tamil Nadu is forested compared to the All India average of around 25%. Forests are concentrated in the hilly areas.
- 1.6 The state is largely dependant on rainfall for recharging its sources of water and therefore the onset or failure of the monsoons plays a key role in its economic well being. The state belongs to a zone of low to moderate rainfall. Its average annual rainfall is around 943 mms and is accounted for by the northeast (Oct. to Dec.-47.6% of total rainfall) and the southwest (June to Sept.-32.4% of total rainfall) monsoons. The distribution and variability of rainfall are important to the economy of the state—both industrial and agricultural. Exhibit 1.1 provides the source of rainfall and distribution between various districts.
- 1.7 In terms of soil characteristics and other agro parameters, the state is composed of three zones. Their features are given in Exhibit 1.2.
- 1.8 In accordance with these characteristics, paddy is grown in Zone I, commercial crops such as sugarcane, cotton and groundnut are grown in Zone II and coarse grains such as jowar, bajra etc. are grown in the dry zone.
- 1.9 The state being close to the equator, has an equatorial climate. The temperature varies from 18°C to 44°C (Exhibit 1.3). The uplands and hills have temperatures varying between 4°C and 20°C.
- 1.10 The northern and southern regions share almost a similar climate while the western region is slightly cooler. This is because it consists of hilly areas while the other two regions are plains. Even within these two regions, the coastal plains are warmer than the interior plains. The state has a long summer (around 10 months) and a brief winter (around 2 months). As the state depends heavily on rains for irrigation and other purposes, the water problem becomes acute during the end of summer and drought conditions prevail if the monsoons fail.

DEMOGRAPHIC CHARACTERISTICS

1.11 The state had a population of 48.41 millions as per the 1981 Census. As per the 1991 Census the population of the state is estimated at 55.63 million and is expected to grow to around 63 million by 2000 AD. As per the 1981 Census about 1 in 3 persons in Tamil Nadu lived in urban areas, thus making Tamil Nadu a highly urbanised state (32.95%) coming next only to Maharashtra (35.03%). (All-India figure 23.7%). The rural population (two-thirds) is spread out among 15,831 villages. Exhibit 1.4 shows the distribution of population between districts.

DEFINITION OF URBAN: INDIA

Criteria for treating a place as urban for the 1981 census are:

- (a) All statutory towns, i.e. all places with a municipal corporation, municipal board, cantonment board or notified town area etc.
- (b) All other places which satisfy the following criteria:
 - (i) A minimum population of 5,000;
 - (ii) Seventy five per cent of the male working population engaged in non-agricultural (and allied) activity; and
 - (iii) A density of population of at least 400 per sq. km. (1,000 per sq. mile)

A town with a population of one hundred thousand and above is treated as a city.

EXHIBIT 1.1
RAINFALL IN TAMIL NADU



1400-1900MM (SW)
850-950MM (NE)

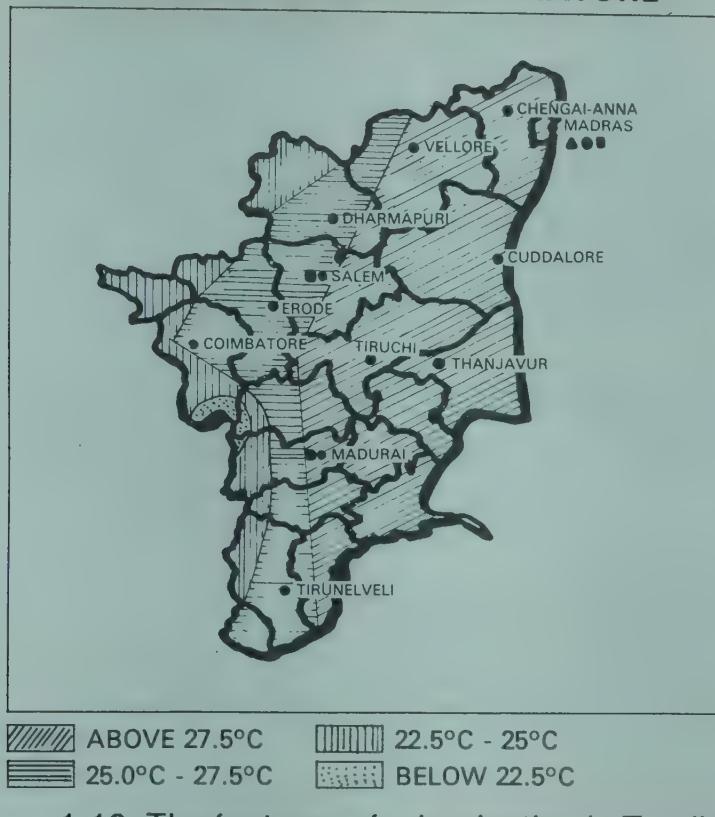
1100-1300MM (NE)
800-900MM (NE)
700-750MM (SW)

EXHIBIT 1.2
SPATIAL DISTRIBUTION



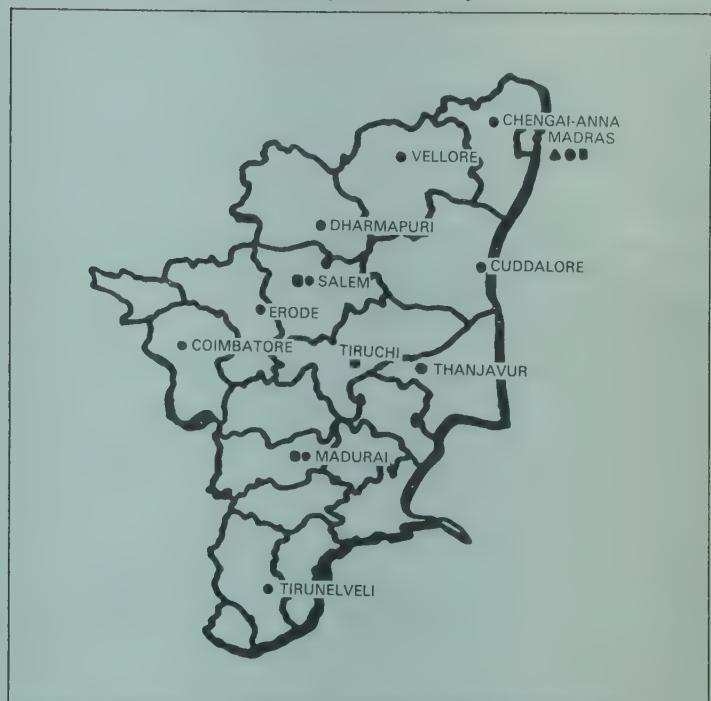
Zone I — Delta areas. Alluvial soil and river irrigated
Zone II — Red loam soil and well irrigated
Zone III — Black soil, dry zone with poor irrigation facilities

EXHIBIT 1.3
AVERAGE ANNUAL TEMPERATURE



ABOVE 27.5°C 22.5°C - 25°C
25.0°C - 27.5°C BELOW 22.5°C

EXHIBIT 1.4
DISTRIBUTION OF POPULATION
1988 (March 1)



PROJECTIONS BY EXPERT COMMITTEE (in '000)

1.12 The features of urbanisation in Tamil Nadu clearly show that there is a clustering of urban areas around:

- metropolitan cities (Madras is 100% urban and is the fourth biggest metropolitan city in the country) and accounts for 6.8% of the state's urban population
- agriculturally advanced areas (delta of the Kaveri regions)
- industrial belts along major transport routes (Madras, Salem, Coimbatore)
- temple regions (Madurai). Tamil Nadu is essentially a temple state with considerable land being owned by temples and much of rural life revolving around temples.

1.13 The degree of urbanisation varies from district to district. Excluding Madras which is entirely urban, Coimbatore is a highly urbanised district while Dharmapuri, Pudukkottai and Ramanathapuram are districts with low levels of urbanisation. It is interesting to note that the urban population occupies only 4.5% of the state's area.

1.14 Urbanisation brings with it overcrowding and the resultant pressures on housing, water, sanitation and other civic services and the resultant deterioration in the quality of life. The density of urban population in Tamil Nadu ('81 census) was 2722 persons/sq.km. (about 10 times the rural density). The density of Madras metropolitan area was 7500 (population of 4.28 million and area of 571.9 km). This high density has resulted in around 18-20% of the state's population living in "slums". A high concentration of slum population in metropolitan cities characterises urbanisation. It is estimated that around 32% of the population of Madras city lives in slums.

1.15 Tamil Nadu is likely to urbanise further, but the rate of such growth is not very rapid as can be seen from the projections in Table 1.1 below. In 1991 the state will be around 36% urban; with cities like Coimbatore crossing the 1 million mark.

TABLE 1.1
URBAN POPULATION ESTIMATES (%)

	1971	1981	1986	1991	1996	2001
Tamil Nadu	30.25	32.95	34.36	35.81	37.27	38.84
India	19.30	23.31	25.26	27.48	30.06	33.06

Source: Census 1981 and Report of the Expert Committee on Population Projections.

BIRTH & DEATH RATES

1.16 Every year in Tamil Nadu there is a net increase in the population of around 7-8 lakhs which works out to an annual growth rate of 1.3 to 1.4%. The population of Tamil Nadu has been growing at a slower rate than the country as a whole as can be seen from Table 1.2

TABLE 1.2
RURAL AND URBAN GROWTH RATES 1971-1981

	ANNUAL GROWTH RATE %	
	RURAL	URBAN
Tamil Nadu	1.23	2.50
India	1.78	3.87

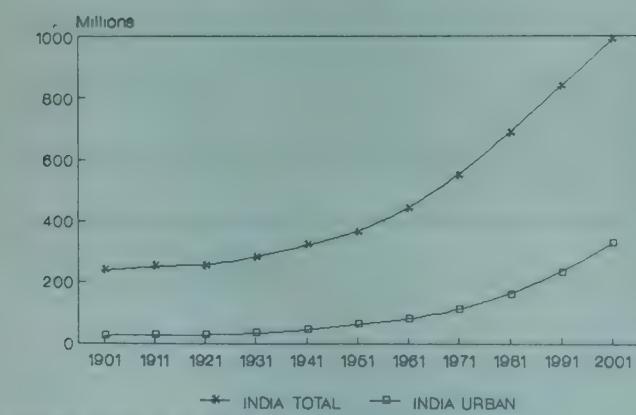
Source: Census of India 1971 and 1981

1.17 The population growth rate is composed of the following components:

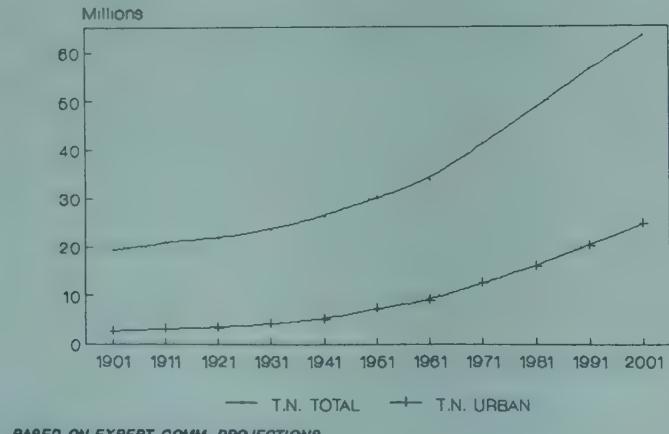
- the birth rate] the annual number of births/
- the death rate] deaths per 1000 population
- the inward/outward migration. The growth rates (urban, and total) are shown graphically in Exhibit 1.5 for Tamil Nadu and India.

EXHIBIT 1.5

**GROWTH OF URBAN POPULATION
TAMIL NADU 1981–2001**

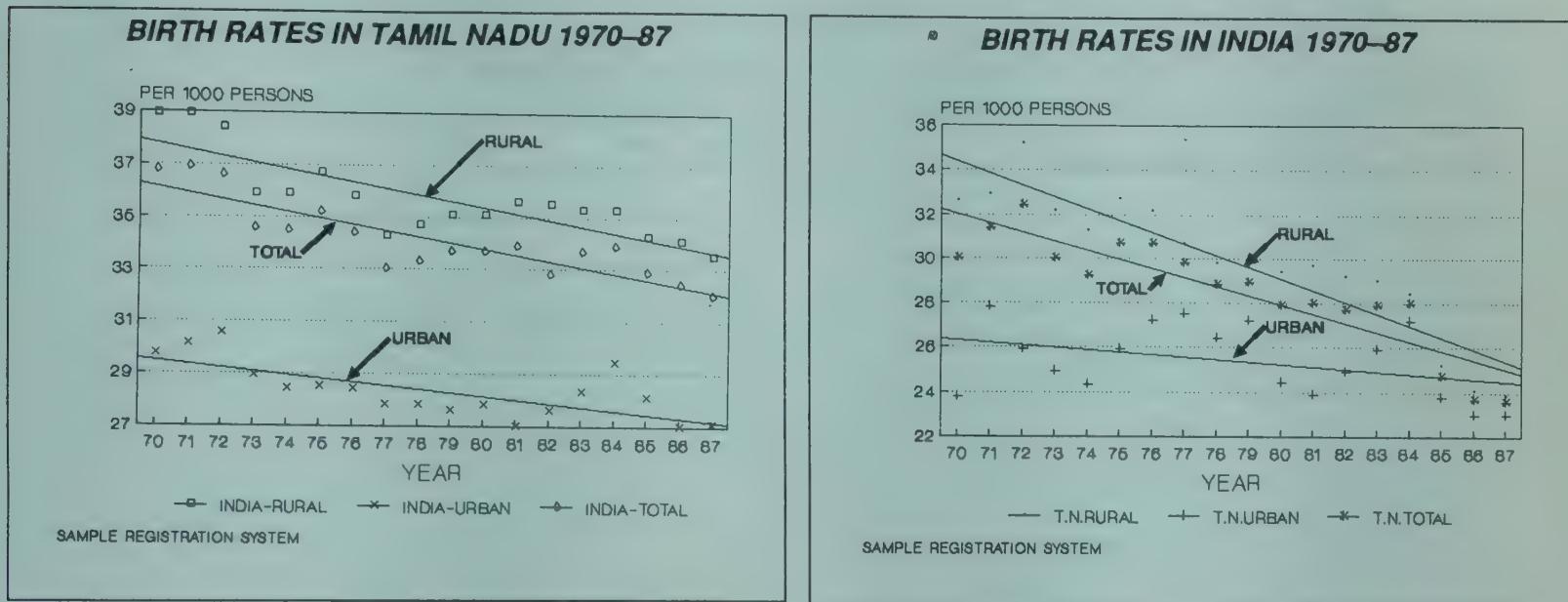


**GROWTH OF URBAN POPULATION
INDIA 1981–2001**



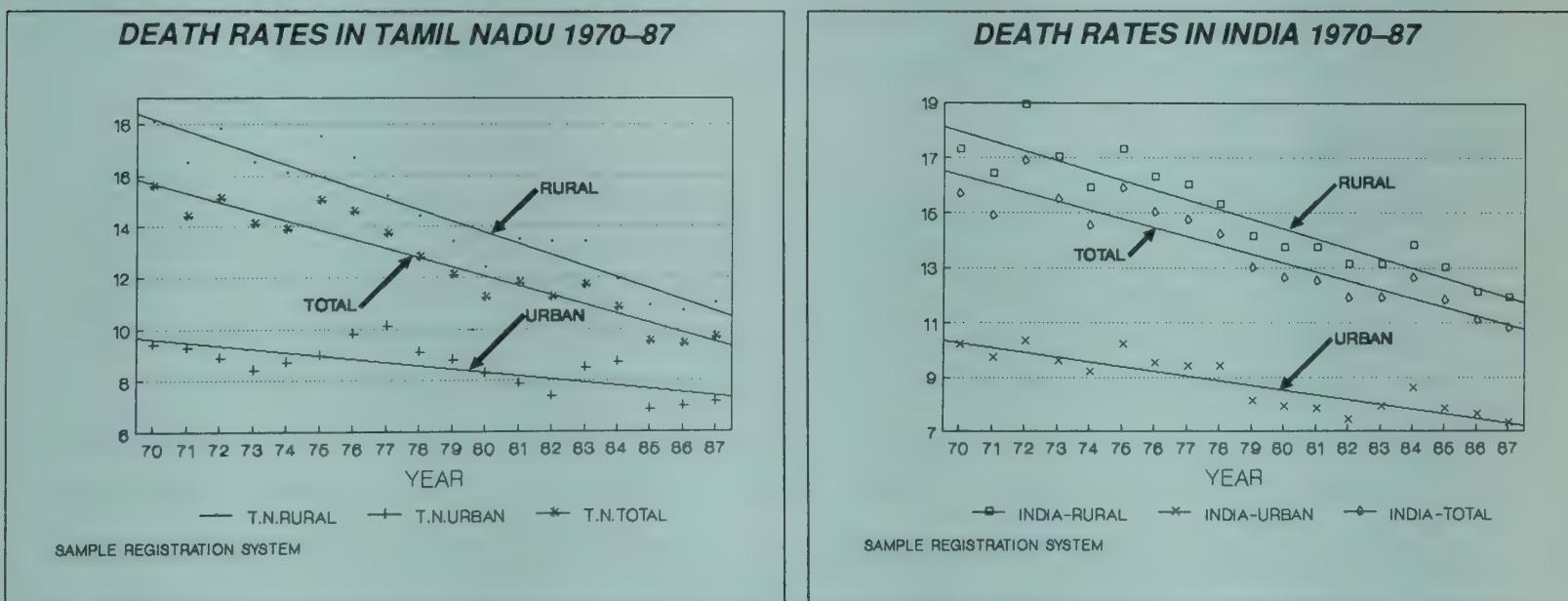
The birth rates both urban & rural in Tamil Nadu are very close to each other (23 and 24 respectively). This is in contrast to the rest of India where the rural birth rate is higher than the urban birth rate by about 24%. This is clearly visible from the graph (Exhibit 1.6). This could be indicative of the relative success of the family welfare programme in Tamil Nadu where the figure of couples "effectively protected" stands at 46.3% against the All India average of 37.5%. (Family Welfare Programme in India Year book 1986-87 data as on 31-3-87).

EXHIBIT 1.6



1.18 Death rates on the other hand continue to show a marked difference between rural and urban Tamil Nadu with rural Tamil Nadu being around 50% higher. This is shown graphically in Exhibit 1.7.

EXHIBIT 1.7



A possible cause of this is the high infant mortality in rural areas which is around 87 compared to 55 for urban areas.

1.19 Migration both inward and outward could affect the population growth. At the state level it is inter district migration which is of relevance. The rate of growth of population in the cities

and towns compared to the villages is an indicator of large scale rural to urban migration. In the urban agglomeration of Madras it is estimated that around 34.5% of the population constitute migrants. (Portrait of Population - Tamil Nadu).

RELIGION AND CASTES

1.20 Hinduism is the main religion (88.9%) of the state followed by Christianity (5.78%) and then Islam (5.21%). The rural/urban distribution of the various religions is shown in Table 1.3.

TABLE 1.3
DISTRIBUTION OF POPULATION BY RELIGION

RELIGION	RURAL	URBAN
Hindus	91.73	83.05
Christians	5.30	6.77
Muslims	2.90	9.90
Jains	0.04	0.25
Sikhs	0.02	0.02
Buddhists	0.01	0.01

1.21 Chengalpattu district has the highest proportion of the Scheduled Castes at 26.21% and Kanyakumari, the lowest at 4.23%. Of the total Scheduled Caste population nearly 80% (7.09 million) live in rural areas. This is because, their literacy level being low at 29% (as against 46.76% for the general population), they are mainly engaged in cultivation and agricultural work. In terms of employment, nearly 80% of them are engaged as agricultural labour and the female participation in work is greater than that of the male.

FAMILY SIZE

1.22 The number of persons per household stands at 4.7 for the state as a whole. Interestingly, the size of the urban household, 4.9 compared to 4.6 in the rural areas represents a deviation from the All-India pattern where rural families are much larger than urban ones (Source: 1981 census). This could represent an increasing intrastate migration to the urban areas due to the poor performance of the agricultural sector as a whole.

1.23 The pattern of distribution of various age groups clearly indicate that in the employable age group (15-49 years) there are more people in urban areas compared to the rural areas.

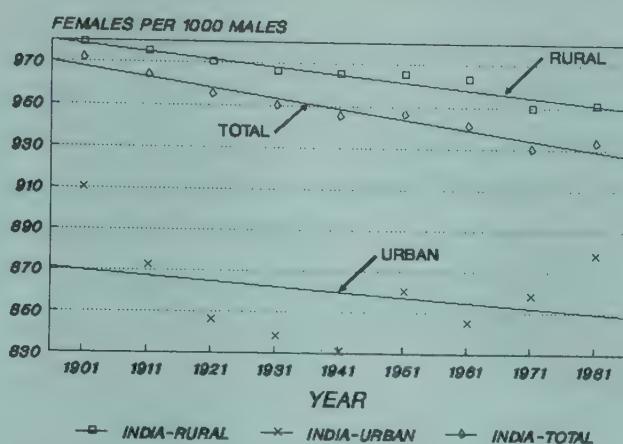
1.24 A favourable sex-ratio (more females compared to males) in some of the predominantly rural districts also points to the same conclusion.

SEX RATIO

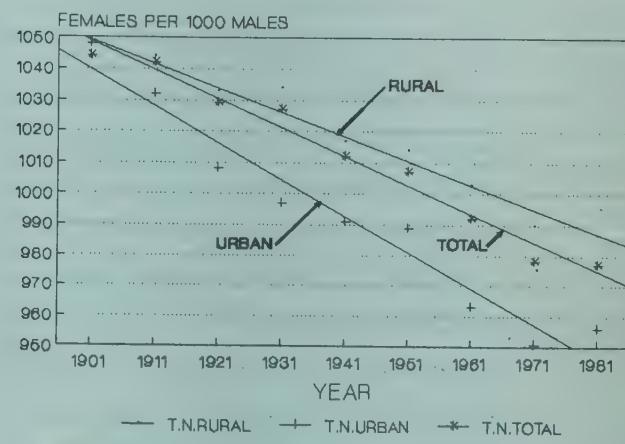
1.25 The sex composition of the population is an important socio-economic indicator. The sex ratio represents the number of females per 1000 of the male population. The movement of this ratio for Tamil Nadu and India is shown in Exhibit 1.8.

EXHIBIT 1.8

SEX RATIO IN TAMIL NADU 1970-81



SEX RATIO IN INDIA 1970-81



Variations in the sex ratio could arise due to differentials in fertility and mortality. The sex ratio in Tamil Nadu at 977 has been higher than that for all India (933). However, over the years the sex ratio in Tamil Nadu has deteriorated from 1050 in 1901 to the present level.

1.26 The rural ratio (987) is better than the urban ratio (956) thus indicating possibly migration of males from rural to urban areas. This fact is also borne out by the sex ratio in excess of 1000 in some of the predominantly rural districts of Tamil Nadu viz. Pudukkottai, Ramanathapuram and Tirunelveli. This is shown in Table 1.4

TABLE 1.4

SEX RATIO IN THE DISTRICTS, TAMIL NADU AND IN INDIA IN 1981

S.No	District/State/Nation	Total	Rural	Urban
	India	933	951	878
	Tamil Nadu	977	987	956
1.	Madras	934		934
2.	Chengalpattu	957	974	931
3.	North Arcot	979	979	978
4.	South Arcot	972	974	963
5.	Dharmapuri	959	960	946
6.	Salem	949	949	949
7.	Periyar	956	960	941
8.	Coimbatore	950	969	931
9.	Nilgiri	957	984	929
10.	Madurai	975	985	958
11.	Tiruchirapalli	985	995	959
12.	Thanjavur	988	988	989
13.	Pudukkottai	1,007	1,012	979
14.	Ramanathapuram	1,023	1,037	990
15.	Tirunelveli	1,044	1,059	1,016
16.	Kanyakumari	985	983	995

Source: Portrait of population - Tamil Nadu, Census of India 1981.

AGE STRUCTURE OF THE POPULATION

1.27 The age structure of the population is the net effect of factors like the birth rate, the death rate and the impact of migration.

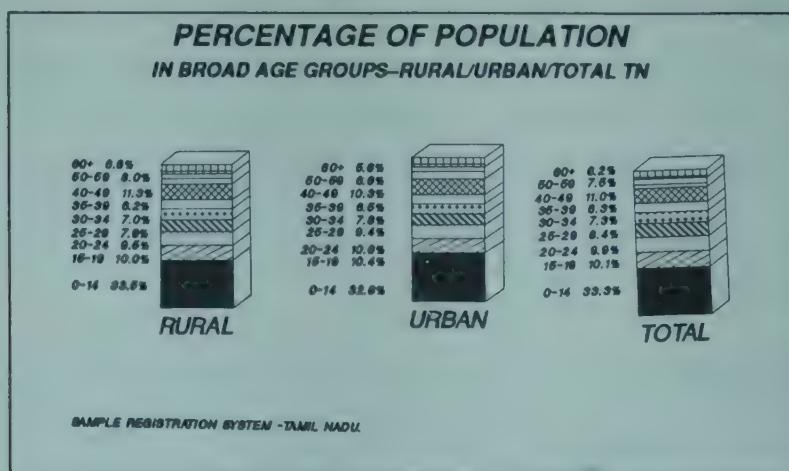
1.28 As per 1981 Census, 35% of Tamil Nadu's population consisted of children in the age group 0-14. This was much lower than the all-India figure of 40%. This percentage is estimated to be around 30% as of 1988 and is likely to decrease to around 27% by the year 2000 AD. In 1981 there were around 16.0 million children in the age group 0-14. By the year 2000 it is expected that there will be around the same number clearly indicating that there would be a drop in the birth rates due to better family welfare measures. There is expected to be an absolute increase in the number of people above 60 years from 4.4 million in 1981 to 6.2 million in the year 2001 AD. The age pyramid from the years 1981-2001 is shown in Exhibit 1.9. (Source : Expert Committee on Population Projections constituted by the Registrar General of India). This has obviously led to a higher percentage of the total population in the age group 15-49, which constitutes the bulk of the work force in the state. This feature indicates clearly that fewer children are being born due to a combination of factors like increasing awareness and implementation of family welfare measures.

EXHIBIT 1.9



1.29 Exhibit 1.10 illustrates the differences in age composition between rural and urban population. Children under 14 and persons beyond the age of 35 are more in rural areas. Persons in the age group of 15-34 are more in urban areas.

EXHIBIT 1.10



DEPENDENCY

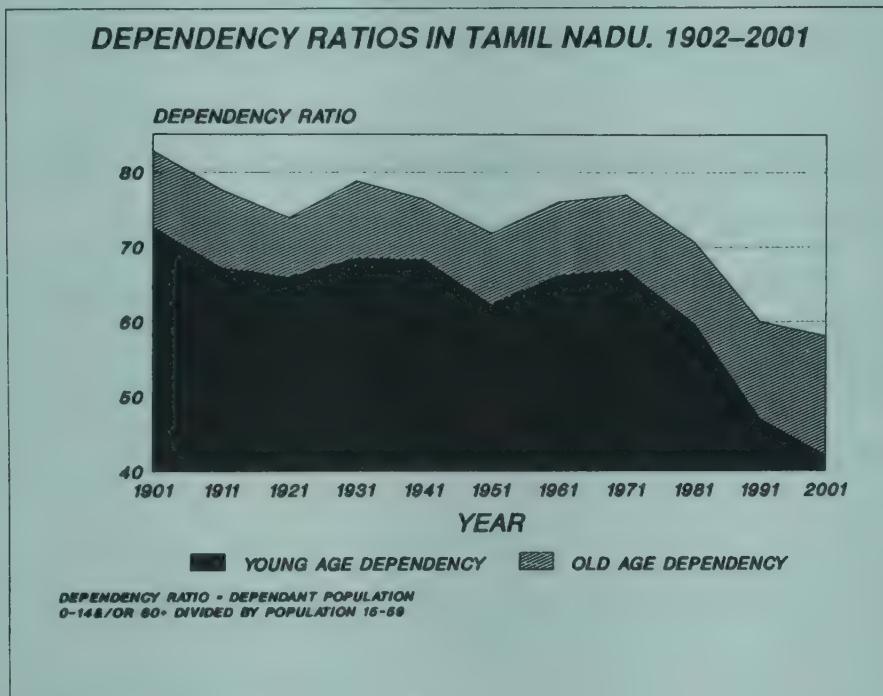
1.30 In any given population, sizeable sections of the population especially infants, school going children and aged people are dependent on the working group. The ratio of such dependent age groups to the total population is considered as an important index of the age distribution of the population. This ratio rests on the basic premise that every individual is a consumer while every individual is not a producer.

1.31 The Dependency ratio is calculated as

$$\frac{\text{Population in the age group (0-14) and 60 and above}}{\text{Population in the age group (15-59)}} \times 100$$

In Tamil Nadu about 70 persons are dependent on 100 members compared to the All-India figure of 85. This is basically due to the comparatively lesser number of children in the total population. The dependency ratio projected for 2001 is 60. The movement of the dependency ratio is shown graphically in Exhibit 1.11

EXHIBIT 1.11



AGE AT MARRIAGE

1.32 The 'age at marriage' of a woman is a critical factor influencing the fertility pattern. The statutory minimum age in India stands at 21 years for males and 18 years for females. The mean age at marriage currently stands at 20-22 years for females for Tamil Nadu compared to the All-India mean of 18-32 years. (Source : Portrait of population: Census of India). An analysis of some nuptiality indicators (percentage of married females to total females in specific age groups) shows that about 0.3% of children in the age group of 0-14 years are married, which translates into around 12-15,000 child marriages every year. If we look at the next age group (15-19 years) the percentage is around 23% which means that around 5 lakh girls are married between the ages of 15-19. These figures indicate the magnitude of the problem of child marriages, leading to teenage pregnancies and consequently the high Infant mortality rates. An analysis of some of the fertility indices in Tamil Nadu (age specific fertility rates and age specific marital fertility rates) indicates that high risk

pregnancies ie. in women below 19 and above 35 could account for as much as 3-4 lakh births every year.

OCCUPATIONAL STRUCTURE

1.33 Around 42% of Tamil Nadu's population constitutes the working population of the state. The bulk of the work force is the age group of 15-59 years. The number of females engaged as part of the work force is showing an increasing trend, though females constitute only about 20% of the total working population. The percentage of main workers is significantly higher in the rural areas compared to the urban (43.2 vs 31.37). It is interesting to note that only around 27.9 of Madras city's population is working. This would be due to the high degree of urbanisation. (Source: Census of India 1981).

1.34 In the rural areas most of the workers are engaged in agriculture and related activities while in the urban areas the jobs are in the manufacturing, industry, trade and transport sectors. It is expected that in the urban areas there are more employment opportunities but there are actually more men than there are jobs. Studies also show that unemployment in Tamil Nadu is higher than the national average ranging from 4% in the rural areas to around 10% in the urban areas (Source: Tamil Nadu Economy: Performance & Issues, Madras Institute of Development Studies).

1.35 Workers are generally classified as occupationally belonging to the three broad sectors:

- Primary (agriculture, livestock, forestry, fishing etc.)
- Secondary (mining and quarrying, manufacturing, processing, electricity, gas and water and construction)
- Tertiary (trade, transport and services).

The ratio of workers in these sectors is shown in the following Table

TABLE 1.5
DISTRIBUTION OF WORK FORCE BY SECTORS

Total/ Rural/ Urban	1971/1981	Percentage of workers under		
		Primary Sector	Secondary Sector	Tertiary Sector
1	2	3	4	5
Total	1971	64.79	14.97	20.24
Rural	1971	81.31	8.72	9.97
Urban	1971	16.70	33.16	50.14
Total	1981	63.88	17.01	19.11
Rural	1981	81.22	9.75	9.03
Urban	1981	15.28	37.35	47.37

Source: Census of India 1971, 1981

1.36 The percentage of workers engaged in the primary sector has remained by and large the same. The share of the manufacturing sector has shown some increase. Nearly half the main workers in Tamil Nadu are illiterate and only about 2% are graduates. An interesting structural change that is taking place in Tamil Nadu is the decline in the household "manufacturing" sector and the increase in the non-household manufacturing sector. As the largest household industry in the state is the handloom industry, this is a reflection of the state of the handloom industry. Tamil Nadu which accounts for about 20% of the country's handlooms, produces about 50% of the country's handloom textiles. The number of handlooms in the state, however, has shown a significant reduction (from around 5.56 lakhs in 1973 to 4.5 lakhs as of 1988). This sector employs around 30 lakh people.

1.37 It is estimated that around 5% of the children in the age group 0-14 are engaged in some form of labour. This accounts for about 8.7 lakh children in 1981 (Table 1.6). Hardly any of these children attended school.

TABLE 1.6
REPORTED CHILD LABOUR IN TAMIL NADU 1961, 1971 AND 1981

Census Year	Total Child Population (0-14)	Child Workers		Total Child Workers
		Male	Female	
1961	12,667,171	590,803	424,014	1,014,817
1971	15,562,040	488,809	224,496	713,305
1981	16,949,313	493,890	377,423	871,313

Source: Census 1971-1981

LITERACY

1.38 A person is considered to be literate if he can read and write with understanding in any language. The "effective literacy rate" after excluding the population in the age-group 0-4 years for Tamil Nadu works out to 52.63%. Female literacy is below male literacy (65.58 vs 39.37). The variation between urban and rural rates is equally significant as shown in the table below. This brings home the poignant situation of the female born in the rural areas and illiterate as can be seen from Table 1.7

TABLE 1.7
PERCENTAGE OF LITERATES

Tamil Nadu	Persons	Males	Females
Total	52.63	65.58	39.37
Rural	43.54	57.83	29.10
Urban	70.92	80.91	60.45

Source: Census of India, 1981

LANGUAGES

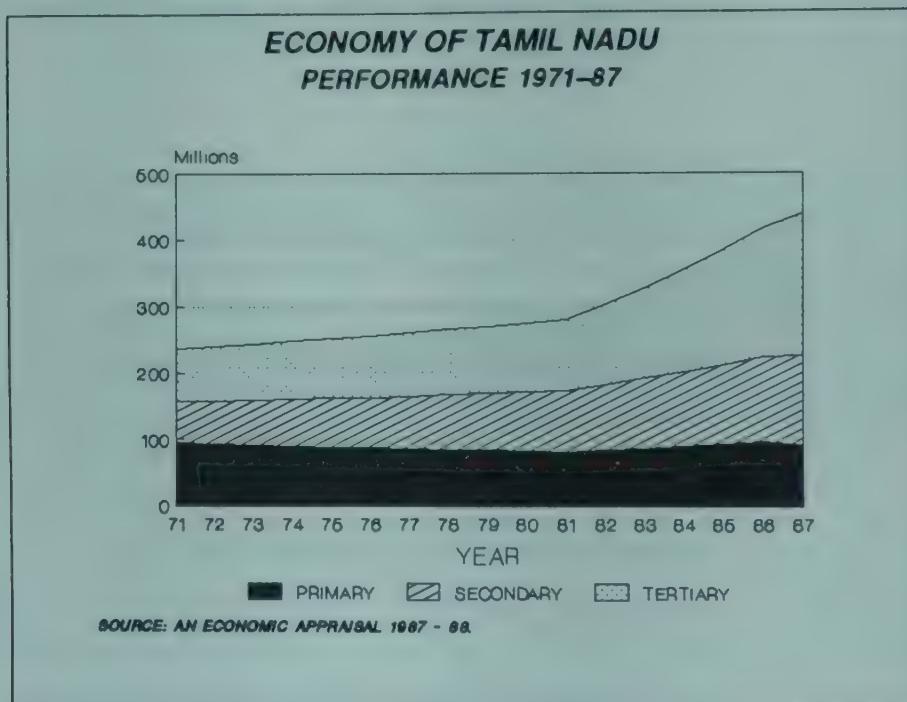
1.39 The state predominantly uses the Tamil language. Nearly 85% of the population's mother tongue is Tamil. A break-up of the languages spoken is given below.

Language	Percentage
Tamil	84.5
Telugu	8.7
Kannada	2.6
Urdu	1.8
Malayalam	1.4
Gujarati	0.5

ECONOMY

1.40 The economy of Tamil Nadu has undergone a structural transformation in the past two decades. Agriculture was for long the major sector of the states' economy. While in the natural process of growth the share of agriculture tends to decline, the magnitude of this decline is very significant in Tamil Nadu. This is clearly visible from Exhibit 1.12 which shows that agriculture today accounts for only a fifth of the state's domestic product and there have been phenomenal shifts to the secondary and tertiary sectors. The most rapid growth has been in the tertiary sector which accounts for almost 50% of the state's domestic products. The state today is among the most industrialised states, ranking second after Maharashtra.

EXHIBIT 1.12



1.41 The performance of the state along with the performance of the country in terms of domestic product is given in Exhibit 1.13. The steady increase in the domestic product of the state after 1982-83 is a point to be noted. The trend in the increase of per capita income for Tamil Nadu and the country as a whole is given in Exhibit 1.14.

EXHIBIT 1.13

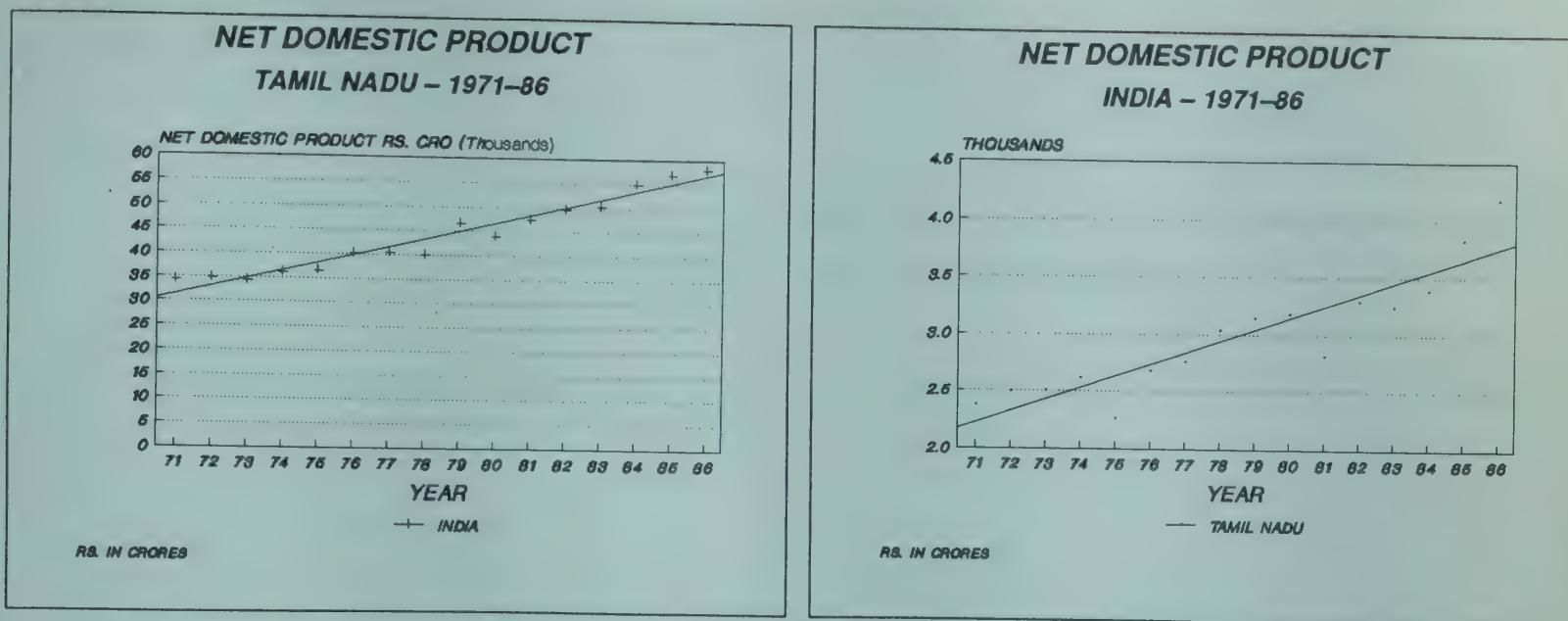
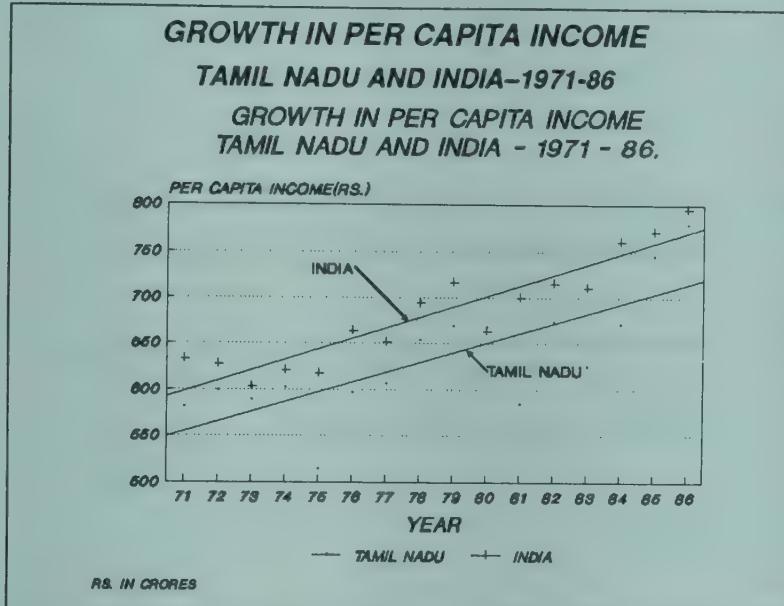


EXHIBIT 1.14



PRIMARY SECTOR

1.42 Agriculture is the sector in which the majority of the people of Tamil Nadu earn their livelihood. Although the share of agriculture in the State Domestic Product has come down, the proportion of people depending on agriculture has only declined from 61.8% in 1971 to 60.9% in 1981. This constant proportion of the working population dependent on agriculture has resulted in a decline of rural agricultural incomes in relation to other sectors.

1.43 The dominant crop in the state is paddy. There are two main crops, short term (KURUVAI) and the SAMBA crop.** (55 lakh tonnes of Samba in 1987-88 out of a total of 75 lakh tonnes). Coarse cereals like cumbu, cholam and ragi have shown a marked decline in terms of the area under cultivation. This has mainly been due to the development of seed and fertilizer technology and increased irrigation facilities, which has been applicable only to paddy.

** The samba crop accounted for almost 85% of the total rice produced in the state in 1987-88.

1.44 Groundnut, sugarcane and cotton are among the important non-food grain crops in Tamil Nadu. Groundnut is more profitable than its substitutes (the coarse cereals) and is hence being cultivated extensively. Sugarcane has shown a continuing increase in terms of both acreage as well as productivity. The production pattern for the major crops is shown in Table 1.8.

TABLE 1.8
PRODUCTION PATTERN FOR MAJOR CROPS

	CROP	Area (in lakh hectares)		
		1986-87**	1987-88	
			Targeted Coverage	Anticipated Realisation
	(1)	(2)	(3)	(4)
1.	Paddy	19.2	26.5	19.8
2.	Millets	15.8	18.0	16.5
3.	Pulses	9.8	12.0	9.5
4.	Food-grains	44.8	56.5	45.8
5.	Oil seeds	11.9	15.4	12.4
6.	Cotton*	1.9	2.8	2.3
7.	Sugarcane	2.1	2.5	2.1

	CROP	Production (in lakh tons)		
		1986-87**	1987-88	
			Targeted Coverage	Anticipated Realisation
		(5)	(6)	(7)
1.	Paddy	53.3	66.0	54.8
2.	Millets	7.15	26.3	15.5
3.	Pulses	4.7	4.8	4.6
4.	Food-grains	73.7	97.1	74.9
5.	Oil seeds	11.4	17.2	13.5
6.	Cotton*	3.4	5.0	5.0
7.	Sugarcane(gur)	23.2	26.0	21.3

* Lakh bales of 170 kg lint each.

** Final Forecast Estimates.

Source: TN - An Economic Appraisal, 1987-88.

1.45 The three major sources of irrigation in Tamil Nadu are rivers, tanks, and wells. However, there has been a shift towards ground water since the 1970's from the traditional sources of canals and tanks. As a result wells contribute 40% while the balance is shared almost equally by rivers and tanks. In Tamil Nadu the tapping of ground water was made possible because of extension of electricity to villages in the 1970's. There has been an addition of pumpsets averaging between 30,000 -35,000 per year resulting in a total population of over one million. The state has nearly 20% of energised pumpsets in the country and ranks first among the states in this respect.

1.46 The coastline of around 1000 kms, along with a large number of reservoirs and tanks as well as estuaries and backwaters provide great potential for the development and utilisation of both marine and inland fisheries. This sector contributes about 1% to the state's domestic product. During 1984-85 the state ranked third in terms of total marine production (Maharashtra, Kerala being first and second respectively). Thanjavur is the largest producer of marine fish followed by Kanyakumari, Ramanathapuram and Tirunelveli. These districts together contribute around 80% of the total marine fish production in the state.

SECONDARY SECTOR

1.47 Tamil Nadu is among the most industrial states in the country. A ranking of Tamil Nadu in some industrial characteristics is presented below (Source: TN an Economic Appraisal 1987-88).

1. Number of factories	Second
2. Fixed capital	Sixth
3. Productive capital	"
4. Number of employees	Third
5. Value of output	"
6. Net Value Added	"

The spatial distribution of factories in the state (as of 1983-84) shows that Madras, Chingleputt, Salem, Coimbatore, Ramanathapuram and Tirunelveli were areas of concentration. In some districts e.g. Nilgiris and Pudukkottai there were very few factories.

1.48 The leather industry derives its importance from the fact that its products are widely traded in the International market. In Tamil Nadu, with its vast livestock population, the industry has a traditional base. That nearly a half of the country's leather processing capacity is to be identified with the State is an index as to how well-placed the industry is in Tamil Nadu. The share of the leather industry in the country's export earnings was 7.5 per cent in 1986-87. It is also important to note that over the years the composition of leather and leather products exported had undergone much of a change from raw hides and skins and semifinished products in the 1950s to value added items like finished leather and

sophisticated leather products in recent times. The co-existence of the registered and small unregistered tanneries is a feature prominently characterising the leather industry in Tamil Nadu.

OTHER INDUSTRIES

- 1.49 Apart from the organized sector, the village and small industries sector covers a wide range of industries including artisan-oriented activities, handicrafts, cottage industries, as well as small scale industries. Handlooms are the single most important village industry in Tamil Nadu. The handloom industry is well entrenched in practically every district in Tamil Nadu (other than the Nilgiris). Important among the handloom products are the silk sarees of Kanchipuram and cotton dhotis, lungis, towels, bedsheets and bedspreads.
- 1.50 An analysis of the performance of Tamil Nadu shows that the "monsoons" on which the agricultural and the industrial sector depend upon (for water/power) have played a dominant role in the economy of the state. There has been a rapid growth in the tertiary sector which is basically the service sector.
- 1.51 This chapter has highlighted aspects of Tamil Nadu which form the back drop to the "Situation Analysis of Children". Certain other features with respect to the environment are highlighted in a separate chapter.

2.

Health Services in Tamil Nadu

2.1 The health situation in Tamil Nadu can best be understood by the study of the commonly accepted health indicators namely, birth rate, life expectancy at birth, death rate and infant mortality rate. Table 2.1 below provides a comparative picture of these indicators between India and Tamil Nadu. Compared to the All India averages, health indicators for Tamil Nadu are better, attributable to better health facilities and infrastructure in the state and better literacy.

TABLE 2.1
HEALTH INDICATORS-A COMPARATIVE PROFILE

Location	Birth Rate	Life Expectancy at Birth	Death Rate	Infant Mortality Rate
	Per 1000 Population	Yrs.	Per 1000 Population	Per 1000 Live Births
India #	32	58.6+	10.8	95
Tamil Nadu #	23.6	60.8+	9.7	.75
# Sample Registration System 1987				
+ Report of the Expert Committee on Population Projections in the light of 1981 Census.				

2.2 India's National Health Policy of 1983 has been responsible for a shift in the approach of the Government of Tamil Nadu as in other States, in increasing its emphasis on mother and child care and involving the community in the activities of health services. Supplementary nutrition to children and expectant/nursing mothers, health check up and health education for pre-school children, immunisation, school health scheme etc. are some of the activities which have been receiving increasing emphasis since 1980. Increasing awareness of the community through health workers, inducting traditional dais in the main stream of health services and fruitful exploitation of the media for propagating immunisation, oral rehydration therapy, family planning etc. are the new activities health services include today. In order to be able to cover the entire population, particularly rural masses effectively, a number of special schemes have been launched with intensive coverage of specific geographic areas.

HEALTH SERVICES IN TAMIL NADU

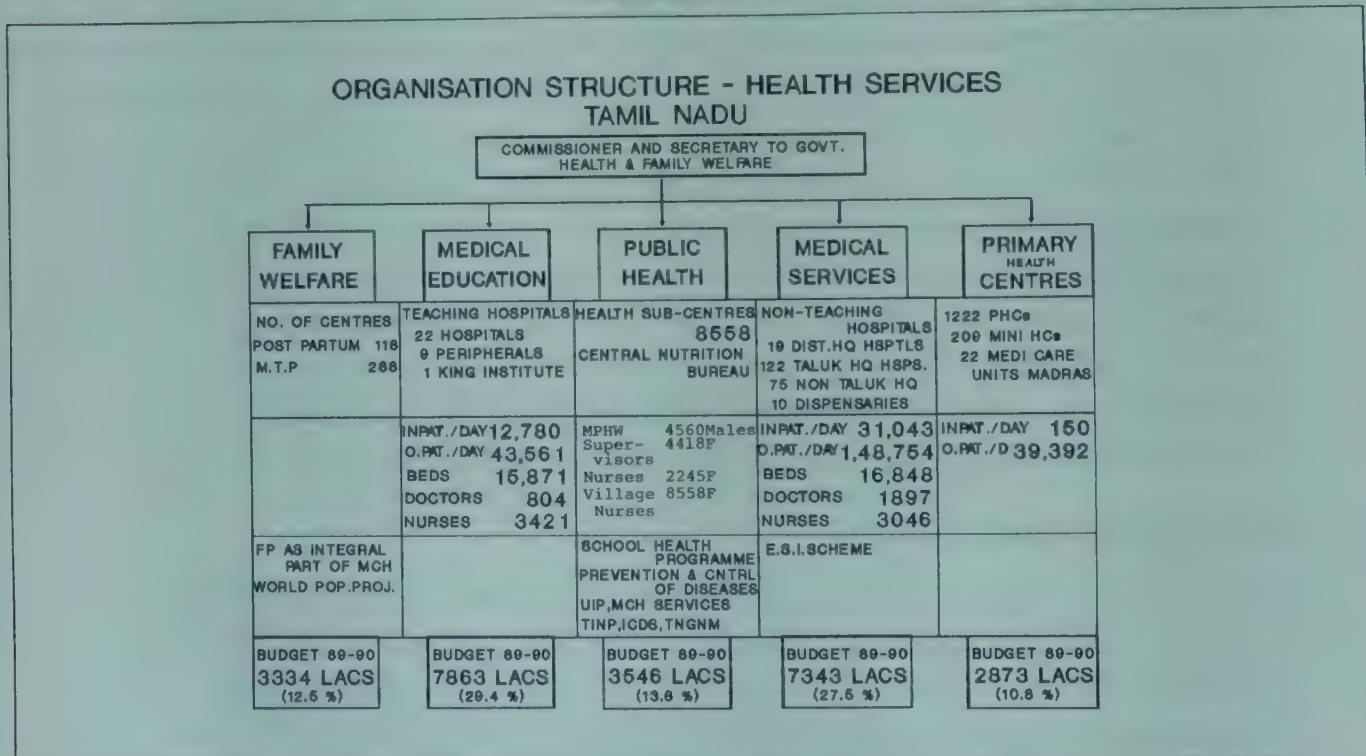
2.3 Exhibit 2.1 illustrates broadly the frame work of health services in Tamil Nadu. All the hospitals (except ESI) in Madras city are attached to the city medical colleges under the control of the Director of Medical Education. Hospitals at Chengalpattu, Thanjavur, Madurai, Tirunelveli and Coimbatore are also attached to the local medical colleges and are under the Director of Medical Education. Apart from these, Cancer Hospital and Cancer Institute at Kancheepuram and King Institute at Guindy are also under the Director of Medical Education.

2.4 The state has been divided into nineteen districts for the implementation of medical services excluding Madras city. The Director of Medical Services and Family Welfare is in overall charge of planning and execution of all programs of medical services and also the schemes under ESI. He is responsible for rendering medical care services through the grid of 19 District Headquarter Hospitals, 122 Taluk Hospitals, 75 Non-Taluk Hospitals and 10 Dispensaries besides Govt. TB Medical Institutions, Govt. Leprosy Medical Institutions and ESI Medical Institutions.

2.5 The family welfare, maternity and child health activities are undertaken effectively under the Family Welfare Post Partum Programmes implemented in medical institutions administratively under DME/DMS. Institutions rendering post partum programmes and medical termination of pregnancies are detailed below:-

	Post Partum Programme	Medical Termination of Pregnancies (MTP)
Teaching Hospitals	9	
District H.Q. Hospitals	19	
Sub-district Hospitals	90	
Govt. Institutions		165
Local Bodies		64
Voluntary & Private Institutions		59
Total	118	288

EXHIBIT 2.1



Directorates of Indian Medicine, Public Health Training and Education, Drug Control, Health Transport and the DANIDA Project are not shown here.

Under urban outreach scheme 176 health posts of different types are being established in various towns/cities to reach families of lower income in urban poor localities. The state is promoting family welfare in a '*holistic approach*' emphasising maternal and child health as the objective and methods of contraceptive cover as only elements to promote this goal.

2.6 Directorate of Preventive Health Care is responsible for promotion of health status of rural population. In Tamil Nadu 1,222 Primary Health Centres are functioning as detailed below:

384 PHCs	for preventive, promotive and curative health and family welfare services
838 Addl. PHCs	for curative and family welfare services*
31 Upgraded PHCs	with 24 bedded hospitals and other infrastructural facilities.

* 274 Mobile Health Teams converted to addl. PHCs.

2.7 The Director of Public Health (DPH) and Preventive Medicine is also in charge of extending health services in rural areas. Health Sub-centre (HSC) is the entry point to the Government system as far as primary health care delivery is concerned. HSCs are established for every 5000 population in plains and for every 3000 population in tribal and hilly areas. The Health Sub-centres (HSCs) being established to provide comprehensive health care to the rural population are under the control of DPH. There are 8558 Health sub-centres as of 31-1-89. Multi-purpose Health Workers Scheme (MPHW) as recommended by Government of India, with one pair each of male and female health workers to carry out all the health activities including family welfare at the sub-centres in rural areas, is also being implemented by DPH. Training of the Traditional Birth Attendants (TBAs) in all districts except Salem and South Arcot is also the responsibility of DPH. The planning and formulation of various programmes to prevent diseases in rural and urban areas, promotion of maternal and child health, malaria eradication, filaria control, epidemic diseases control, industrial hygiene, community nutrition research and education, health education, health and vital statistics, analyses of food and water samples etc. are also under DPH. He is the statutory Chief Registrar of Births and Deaths under the Act of 1977 and is the State Health Authority under the prevention of Food Adulteration Act.

2.8 Exhibit 2.2 schematically depicts the chain of health service facilities. Referral cases from villages have to be canalised as shown in the Exhibit. Primary Health Centres and community health units are under the Directorate of Preventive Health Care while it can be observed that Health sub-centres which at times functionally report to PHCs are under DPH. Training of Dais and Multi-Purpose Health Workers (MPHWs) are under the Directorate of Public Health. The Taluk and District Hospitals, as seen earlier, are under the Directorate of Medical Services and Medical Education. Thus at many levels the organisations and functionaries have divergent functional and administrative reporting structures.

HEALTH EXPENDITURE

2.9 Per capita expenditure on health in Tamil Nadu budgeted for 1989-90 is Rs. 48.6 and per capita expenditure on family welfare is Rs. 7.0. Table 2.2 illustrates per capita expenditure on health and family welfare for both Tamil Nadu and All India.

TABLE 2.2
PER CAPITA (GOVT.) EXPENDITURE ON HEALTH

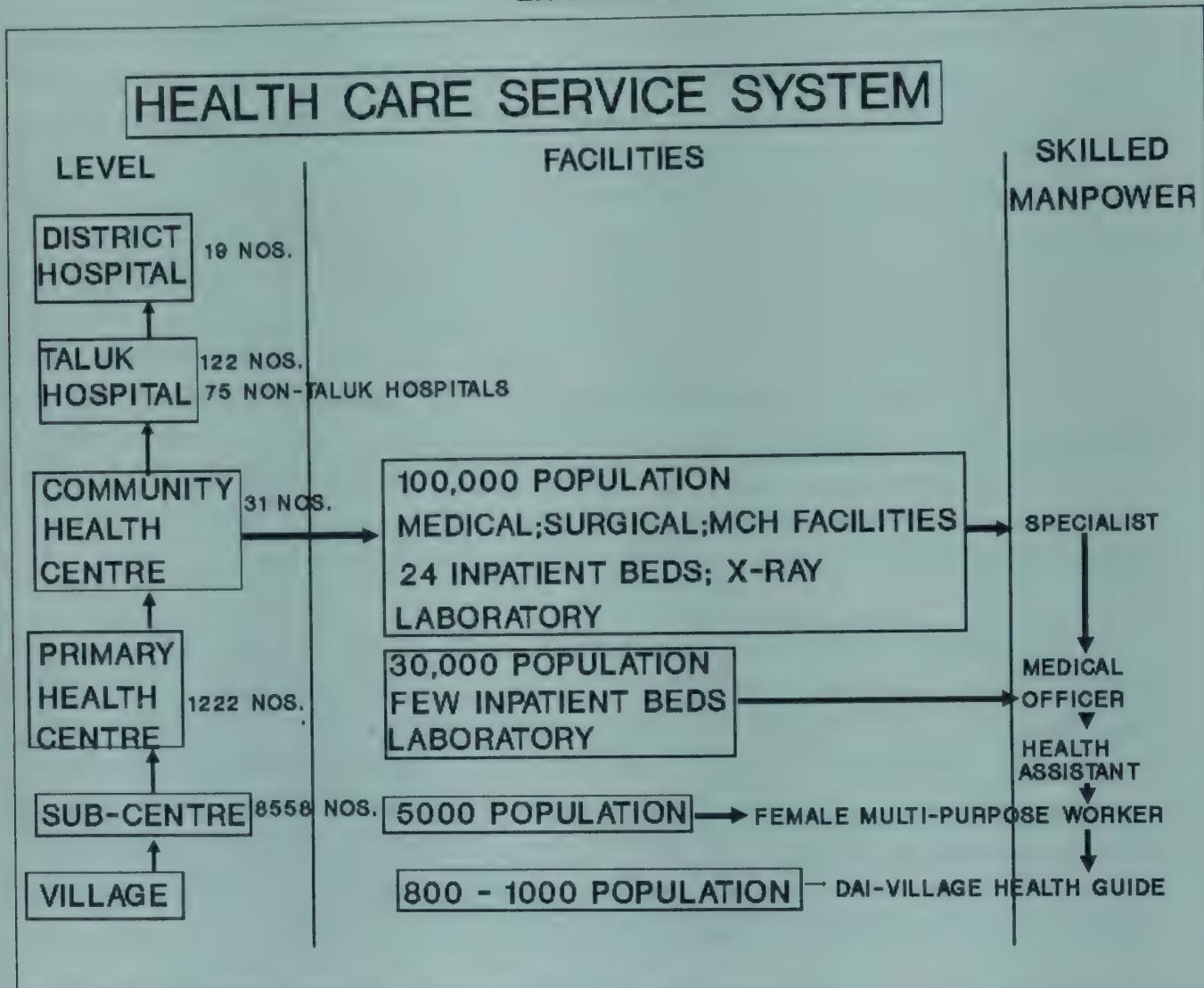
(in Rs.)

	1983-84		1984-85		1985-86	
	Health	F.W.	Health	F.W.	Health	F.W.
Tamil Nadu	50.76	4.63	40.84	5.39	47.57	5.23
All India	37.20	5.41	41.24	5.88	46.23	7.19

Source: Health Information of India, CGHT, New Delhi.

It can be seen that per capita expenditure on health in Tamil Nadu has been higher than the All India level, but family welfare per capita expenditure has been lower. However, an interesting factor is that while at All India level expenses on health has increased steadily during 83-84 to 85-86 period, in Tamil Nadu it has actually gone down.

EXHIBIT 2.2



MEDICAL CARE SERVICES

2.10 Medical Education and Medical Services Departments share the load of hospital services being provided in Tamil Nadu. Table 2.3 illustrates the distribution of hospital services between rural and urban areas.

TABLE 2.3
DISTRIBUTION OF HOSPITAL FACILITIES*
RURAL/URBAN (AS ON 1-1-1988)

	Rural	Urban	Total
Hospitals	85	278	363
Beds	4,254 (9.3%)	41,579 (90.7%)	45,833 (100%)
Average beds	50	150	126

* Source: Health Information of India 1988, CBHI, New Delhi

It can be seen that over 90% of the beds available in Tamil Nadu are in urban areas. Since only one third of Tamil Nadu's population is urban, the effective ratio of the population served per bed would be 8530 for rural areas and 430 for urban areas. Hospitals in the rural areas are generally smaller in capacity in terms of beds per hospital (Table 2.4).

TABLE 2.4
DISTRIBUTION OF HOSPITAL FACILITIES OWNERSHIPWISE (1-1-88)*

	Government	Local Bodies	Pvt. & Vol. Orgn.	Total
Hospitals	283	7	73	363
Beds	35,849 (78.2%)	479 (1.0%)	9,505 (20.8%)	45,833 (100%)
Average Beds per Hospital	127	68	130	126
Population served/bed				1182

* Source: Health Information of India 1988, CBHI, New Delhi

2.11 Private and voluntary agencies contribute to only 21% of the beds available in Tamil Nadu. Hospitals under local bodies are smaller in size with less than 100 beds. Population served per bed is 1182 in Tamil Nadu as against an All India average of 1351.

2.12 Dispensaries with bed facilities are owned by Government agencies only. 74% of these are concentrated in urban areas. Table 2.5 summarises the position of dispensaries.

TABLE 2.5
DISPENSARIES AND BEDS ACCORDING TO RURAL/URBAN & OWNERSHIP AS ON 1-1-88

(A) Rural / Urban

	Rural	Urban	Total
Dispensaries	143	355	498
Beds	48 (26.7%)	132 (73.3%)	180 (100%)

(B) OWNERSHIP OF DISPENSARIES

	Government	Local Bodies	Pvt. & Vol. Orgn.	Total
Dispensaries	222	247	29	498
Beds	68	112		180

Medical and Para-medical manpower

2.13 There are at present 8 medical colleges and one dental college in Tamil Nadu. Twenty two teaching hospitals alongwith these colleges are directly under the control of Government. Three medical colleges and one dental college are in the city of Madras and the remaining five medical colleges are in the districts. These institutions cater to over one thousand graduates and nine hundred post-graduates (degree, diploma and higher specialities) besides training candidates in para- medical courses every year.

2.14 The number of medical and para-medical personnel of Tamil Nadu compared to All India figures are given in Table 2.6. Though compared to 1981 the population served per doctor/para medical personnel has increased but, when compared to All India level these are better.

TABLE 2.6
REGISTERED MEDICAL AND PARA-MEDICAL PERSONNEL
IN THE ACTIVE LIST AS ON 31-3-88

	Nos.#	Tamil Nadu Population per*		All India Population Per*	
		1981	1988	Nos \$	1987
Registered Doctors	44026	1100	1260	306966	2492
Indian Medicine & Homeopathy	29779				
Dentists	10153	4768	5460	9725	78663
Nurses	28011	1728	1980	197735	3870
Midwives	34484	1404	1610	171590	4460
ANMS	5664	8547	9780	98543	7760
Pharmacists	17682	2738	3130	NA	NA
Health Visitors	846	57219	65500	12411	61640
# Active list		\$ ICMR Registration			
State Population		1981	484 Lacs		
		1988	541 Lacs		
All India		1988	7650 Lacs		

* Per professional manpower

MEDICAL FACILITIES FOR CHILDREN & MOTHERS

2.15 The Institute of Child Health (ICH) at Madras has 537 beds. ICH, Stanley Hospital and Madurai Medical College are the only post graduate institutions in the state in paediatrics with all specialities. There are another 852 beds for Paediatric in teaching hospitals. With a view to extending specialist services, 63 paediatric clinics are functioning in non-teaching hospitals in Districts and Taluks. There are around 3000 paediatrics degree and diploma holders in Tamil Nadu.

2.16 Under the Department of Medical Education (DME) there are three maternity hospitals in Madras and 2266 beds for Gynaecology and Obstetrics in teaching hospitals. Of the total inpatients in all teaching hospitals, 41.9% are females and 17.8% are children.

MOTHER AND CHILD HEALTH CARE PROGRAMMES (MCH)

2.17 Over the recent years there has been an increasing emphasis on Mother and Child Health Care programmes as a tool to decreasing the Infant Mortality Rates and mortality and morbidity among children. At the first instance the emphasis was on health related components like immunisation, prophylaxis against certain deficiencies etc. Gradually emphasis shifted to comprehensive mother and child care. Even for family welfare programmes the emphasis shifted to pre and post natal care (Eg.: World Bank Population Project). A list of programmes in operation along with their objectives, period and coverage are given in Table 2.7.

2.18 Recognising the linkage of health to nutrition and the prevalent level of understanding among the mothers on feeding the children, noon nutrition became a component of some of the special intensive programmes launched. Communication, training and nutrition formed the major components of these programmes. Further, these programmes are aimed at reaching the grass root level with special focus on rural and tribal areas.

TABLE 2.7

HEALTH CARE FOR CHILDREN, PREGNANT WOMEN AND LACTATING MOTHERS

Scheme	Objective / Programme	Period	Coverage	Budget/ annum
School Health Scheme	Medical check up and health appraisal for children of age 6-11. Needy children are treated with drugs and if required referred to nearest hospitals. Cumulative Health card is maintained up to age of 11.	Introduced from 1961	153 PHCs and 48 municipalities extended to all PHCs and municipalities in 1987-88. 6.9 lakh children covered.	Rs.71.3 lakhs
Maternal and Child Health Services	To cover women in the child bearing age and children below 16 years. Covers antenatal, intra-natal and post natal care to the mother and health care to infants and toddlers.	Regular Programmes	Rural areas through PHCs, Urban areas through municipalities. Coverage as of 1986 Antenatal mothers registered 7.14 lakhs No. of labour cases conducted 4.10 lakhs	Rs.87.87 lakhs
Universal Immunisation Programme	To immunise pregnant mothers against tetanus and all infants against Polio, Diphtheria, Tetanus, Whooping cough, Measles and Tuberculosis	1985-86 onwards in a phased manner to cover all districts by 1989-90	Coverage all districts TT (EM) 10.33 lakhs DPT 11.42 " Polio 11.35 " BCG 8.26 " Measles 8.6 "	Rs. 64.93 lakhs in 1988-89

TABLE 2.7 (Contd.)

Scheme	Objective/Programme	Period	Coverage	Budget/ annum
Control of Anaemia among Pregnant Women	To provide Folic Acid Tablets (FST) large to pregnant women through Auxillary Health Staff of PHC and HSC	Regular Scheme	12.81 lakhs pregnant women	
Control of Anaemia among Children	As a prophylactic against anaemia among children FST (small) administered to children 1-12 years	Regular Scheme	24.27 lakhs children	
Control of Blindness among Children	Prophylactic doses of Vitamin A solution orally through PHC in rural and MCH centres in Municipal areas.	Regular Scheme	In 1987-88 actual coverage I Dose 30.20 lakhs, II Dose 37.33 lakhs	
Oral Rehydration Therapy (ORT)	To create awareness in community on use of House Available Fluids (HAF) to prevent dehydration among children suffering from diarrhoea. To orient field functionaries in improved skills in dehydration cases and make wide use of Oral Rehydration Salt (ORS) packets.	Regular Scheme	In 1988-89 training of Staff at Egmore, Salem and Gandhigram. Purchase of ORT packets and supply of health education materials to PHCs.	Rs. 22.86 lakhs in 88-89
Acute Respiratory Infection (ARI) Intervention Programme	To prevent deaths due to respiratory infection	1989-90	Experimental basis in four blocks	
World Bank Aided Population Project.	Main objective is to improve and extend the quality of Maternal and Child Health and Family Welfare services in Madras city and suburbs (i) Immunisation, antenatal, post-natal coverage 95% (ii) Institutional deliveries 98% (iii) Birth order reduction of proportion of 2 + (iv) Couple protection 60% (v) Growth rate monitoring 80%	1988-95	Madras and suburbs	Rs. 68.71 crores (Spread over 7 years)

2.19 Among all the health and nutrition intervention programmes operating in the state, at the grass root level, mother and child health care programmes which emphasise integrated approach to child development need special mention. These programmes provide a combination of services to the pre-school children and pregnant and lactating mothers which include:

- (1) Supplementary nutrition
- (2) Immunisation
- (3) Health check up and referral services
- (4) Non-formal pre-school education and
- (5) Nutrition and health education for women.

Some of the important child development programmes operating in the state include ICDS, TINP, TNGNMP, DANIDA and MUDP. Under these programmes an extensive network (of anganwadi workers, community nutrition workers etc.) has been created. These workers are supplemented by the grass root level health workers, like multi purpose health workers, auxillary nurse midwives etc.

INTEGRATED CHILD DEVELOPMENT SERVICES (ICDS)

2.20 ICDS has now emerged as the most extensive national programme related to overall child development. The programme is operated by the Ministry of Human Resource Development, Government of India. In Tamil Nadu, the scheme was first introduced in 1975-76 in Madras City, Thally and Nillakottai blocks. The scheme has since been extended and at present there are 65 projects covering 37 urban, 27 rural and 1 tribal area. For the financial year 1989-90, an additional 13 new projects have been sanctioned.

2.21 Each ICDS project is intended to cover 100,000 population. Each project has a child development project officer and four to five supervisors. The urban projects have an exclusive medical officer and four ANMs, while in the rural and tribal projects, the health care is linked to Primary Health Centres. In each project area around 100 child welfare centres (anganwadis) are functioning. Each anganwadi is run by an anganwadi worker.

2.22 The focal point for the delivery service is the anganwadi, which covers a population of 1000 and provides services to 100 beneficiaries which includes 30 children in the age group 0-2, 40 pre-school children in the age group 2+ to 4 and 30 pregnant and nursing women. The following services are provided in each anganwadi.

Supplementary Feeding

2.23 Under this component, children in the age group of 6 months to 2 years and pregnant and nursing women are provided with 'Sathu' meaning nutritious food, under the centrally sponsored Wheat Programme. Eighty grams ration of 'Sathu' in the following composition is provided for 300 days:

Wheat	60 Per cent
Fried gram	15 Per cent
Jaggery	25 Per cent

2.24 The expenditure per beneficiary is 50 paise per day and the entire expenditure is reimbursed by the Central Government. Children in the age group 2 to 4 in the project areas are covered under the Tamil Nadu Government Nutritious Meal Program (TNGNMP).

Non-formal Pre-school Education

2.25 Children in the age group 2 to 4 are given non-formal pre-school education at each anganwadi. Emphasis is laid on activities which stimulate mental, social and emotional development of children. A thematic approach is adopted, with the use of low cost play materials developed at the anganwadi.

Health Care and Immunisation

2.26 Immunisation of all children less than 6 years of age against polio, measles, diphtheria, tetanus, whooping cough and tuberculosis is done in the project. Immunisation against tetanus is done for all expectant mothers. The health care component includes recording of weights at periodical intervals and general check-up every 3 to 6 months. Periodic deworming, administration of massive doses of Vitamin A once in six months and iron and folic acid supplements (100 tablets) are provided for children. Ante-natal care of expectant mothers and post-natal care of nursing mothers is also provided.

Health and Nutrition Education

2.27 Health and nutrition education is offered to all women in the age group 15-45 years, with priority being given to nursing mothers and mothers of children suffering from malnutrition and frequent illnesses. The messages of health and nutrition education are imparted through specially organised courses and campaigns in the project areas like home visits by anganwadi workers, cooking demonstrations, use of mass media and other forms of information dissemination.

Coverage

2.28 As stated earlier, there are 65 projects in Tamil Nadu, with 5607 centres, benefitting 1 lakh children below 2 years, 2 lakh children in the age group 2 to 4 and 0.6 lakh pregnant and nursing mothers each year. The annual outlay on the project is Rs. 8.7 crores.

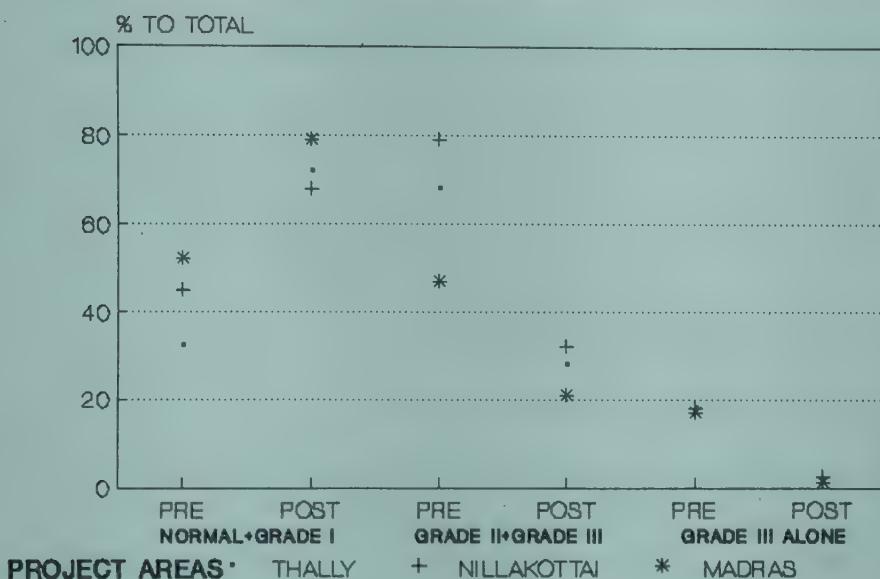
Project Impact and trends

2.29 Department of Social Welfare has been entrusted with a task of monitoring the implementation and effectiveness of the programme. The data is collected at each anganwadi on a regular basis and is consolidated by the Child Development Project Officer (CDPO) who sends it to district and state monitoring cells for corrective action. This data indicates that the program has been fairly successful in achieving its objectives.

- (1) The program coverage is fairly high benefitting 40-80% of target beneficiaries in urban project areas. The coverage is lower at 40-60% in the rural project areas.
- (2) Nutritional status of children in the project areas has improved considerably since the implementation of this scheme. (See Exhibit 2.3). The percentage of severely malnourished.

EXHIBIT 2.3

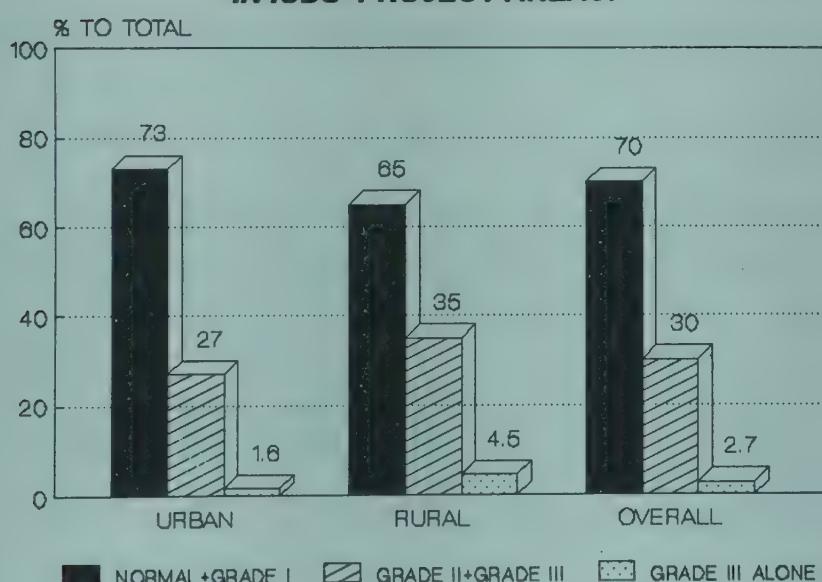
**NUTRITIONAL STATUS OF CHILDREN (6-60 months)
IN ICDS AREAS**



children (0-5 years) has come down to 1.6% in the urban and 4.5% in rural project areas. (Exhibit 2.4).

EXHIBIT 2.4

**NUTRITIONAL STATUS OF CHILDREN (6-60 months)
IN ICDS PROJECT AREAS.**



- (3) Immunisation coverage of children is high at 80% - 100% in urban projects and 40-60% in rural projects. TT immunisation coverage of pregnant women is lower at 50—80% in both urban and rural areas.
- (4) Coverage under Vitamin A programme, deworming and iron supplementation is also fairly high.
- (5) As a result of these health and nutrition measures, the mortality rates in the project areas are far lower than the average for the state (Table 2.8).

TABLE 2.8
MORTALITY RATES IN ICDS AREAS

	ICDS AREAS-1988		STATE AVERAGE-1987	
	URBAN	RURAL	URBAN	RURAL
Still Births *	14.9	17.5	8.5	11.4
Infant Mortality Rate	49	52	50	87
Maternal Mortality	0.8	0.8	1.1	2.3

* Better recording of data and hence higher figures.

TAMIL NADU INTEGRATED NUTRITION PROJECT (TINP)

2.30 The World Bank assisted Tamil Nadu Integrated Nutrition Project (TINP) was set up with an objective to improve the health and nutritional status of pre-school children and to extend the health services to pregnant and nursing mothers. The project commenced implementation in November 1980 in Kottampatti block in Madurai district on a pilot basis and since then has been extended to 9 districts in a phased manner.

2.31 The total outlay on the project is Rs. 55.8 crores. It is one of the most focussed and successful programmes of its kind. The project has three major components:

- (1) Nutrition Delivery Services
- (2) Rural Health Services
- (3) Communication Services.

2.32 The co-ordination between these services is being done by the Project Co-ordination Office located in Madras.

Nutrition Delivery Services

2.33 These include nutritional surveillance for all children in the age group 6-36 months and supplementary feeding for malnourished children identified using weight-gain method. The feeding is given to selected children for 90 days and those gaining adequate weight are graduated and the rest are referred to the Health system for any possible health disorders with supplementary feeding being continued. The food supplement is a "laddu" consisting of a specially developed composition of cereals and pulses and is supplemented with minerals and vitamins. Composition of laddu is as follows:

Wheat	35
Jowar	20
Jaggery	35
Edible Groundnut cake	10
Bengal gram dhal	10
Vitamin and Mineral Pre-mixes	2
Total	112 parts

The daily ration is determined on the basis of the age of the child and the degree of malnutrition but ranges between 80-100 gms. It provides roughly 380 calories of which protein content is 13%. The food supplement is wheat-based rather than rice-based to avoid the tendency of supplement being treated as the main meal. Supplementary feeding to pregnant and nursing women is given on a selective basis with selection of women being done on the basis of certain objective criteria. The focal point for all the project activities at the village level is the Community Nutrition Centre (CNC) which on an average covers 1500 population. The CNC is run by a Community Nutrition Worker who is assisted, guided and supervised at different levels by Nutrition Supervisor, Nutrition Instructress, Taluk Project Nutrition Officer and District Project Nutrition Officer.

Health services

- 2.34 The health component has been designed recognising the synergies between malnutrition and infectious diseases among children. The broad objective of this component is to improve significantly the maternal and child health care system. The component specifically aims at reducing the infant and child mortality and better coverage of mothers through ante-natal and post-natal services. It also lays stress on better home management of diarrhoea, and prophylaxis against Vitamin A deficiency, iron and folic acid supplementation and administration of deworming medicine.
- 2.35 The health service delivery point is the Health Sub Centre (HSC) serving on an average a population of 5,000 which is staffed by one female and one multipurpose health worker (MPHW).

Communication Services

- 2.36 The main objective of this component is to motivate the target population to bestow better nutrition care on 6-36 months old children and expectant and nursing women. Stress is made on two methods.
 - (1) Mass media which include films, posters, wall paintings, hoardings, villupattu, video and audio cassettes etc.
 - (2) Inter-personal contacts with the core section of the target audience.

This component of the project is a unique experiment in social marketing and is specially important for the long term success of the project as it emphasises on changing the knowledge, attitude and practices (KAP) of women.

Coverage

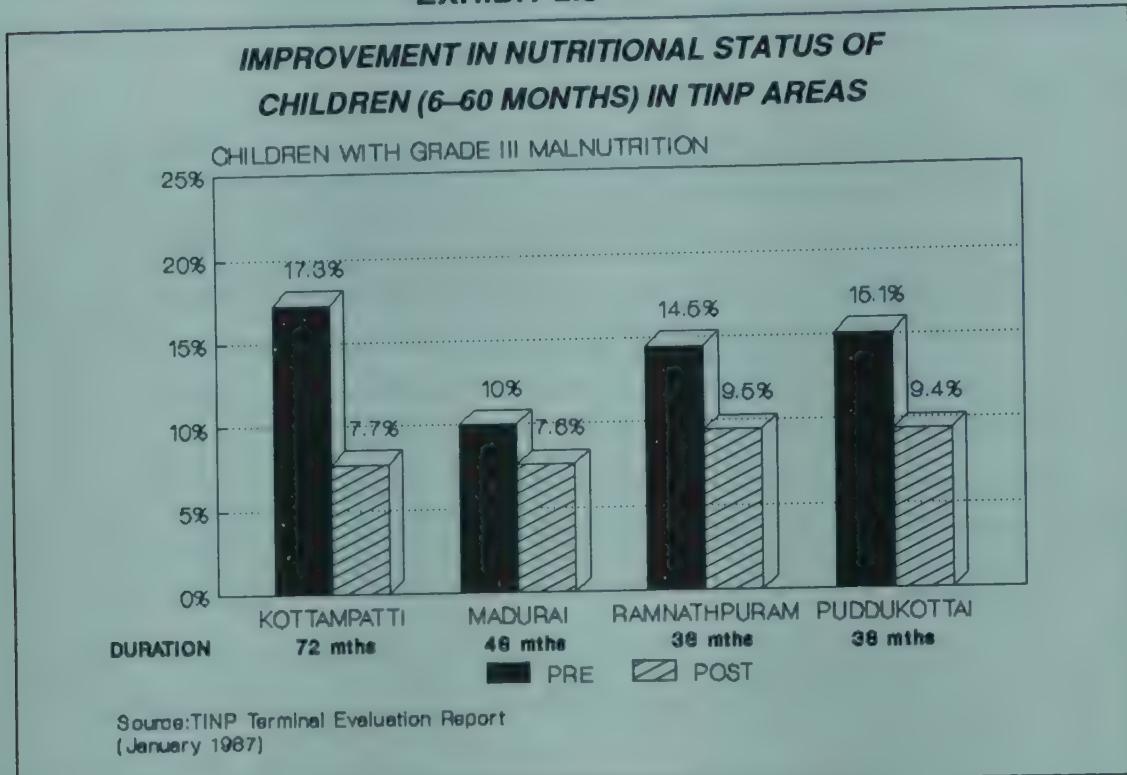
- 2.37 As on December 1988, there were about 9,000 centres operating under TINP, benefitting about 6.4 lakh children in the age group 6-36 months and 2.6 lakh pregnant and lactating mothers. In fact the health services under the project are extended to children upto 5 years. The annual outlay on the project is Rs. 7 crores.

Impact of the project

- 2.38 The impact of the project and its coverage is regularly monitored by the monitoring wing functioning under Project Co-ordination office. The base line surveys and the periodic evaluation of the project were also carried out on a regular basis by the Department of Evaluation and Applied Research. These indicate that the project has been highly successful in reducing the infant mortality, incidence of severe malnutrition and prevalence of micro-nutrient deficiency diseases in the project districts. More specifically:

(i) There has been a definite reduction in the prevalence of severe (Grade III) malnutrition. Exhibit 2.5 which gives the data obtained during the base line and terminal evaluation (January 1987) survey indicates that the prevalence of Grade III malnutrition has registered a significant decline the highest being 55% in Kottampatti block where the project has been operational for 72 months, and the lowest being 24% in Madurai district, which started off with relatively lower prevalence rates for Grade III malnutrition at the time of the baseline survey.

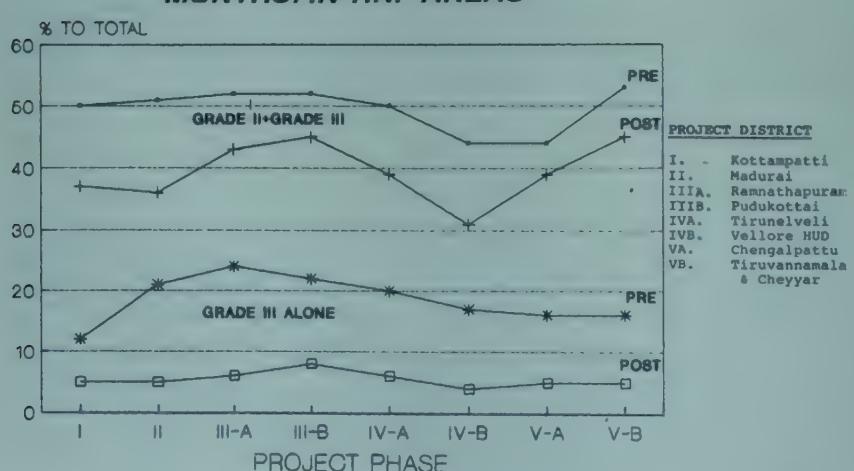
EXHIBIT 2.5



(ii) The monitoring wing data which relates to children of 6-36 months gives even more spectacular results (Exhibit 2.6). The rate of reduction was the highest in Madurai and Vellore (76%) followed by Ramanathapuram (75%). Kottampatti block in fact registered the lowest decline of 58%. This may be due to the fact that the level of malnutrition as assessed at the beginning of the project was fairly low in Kottampatti.

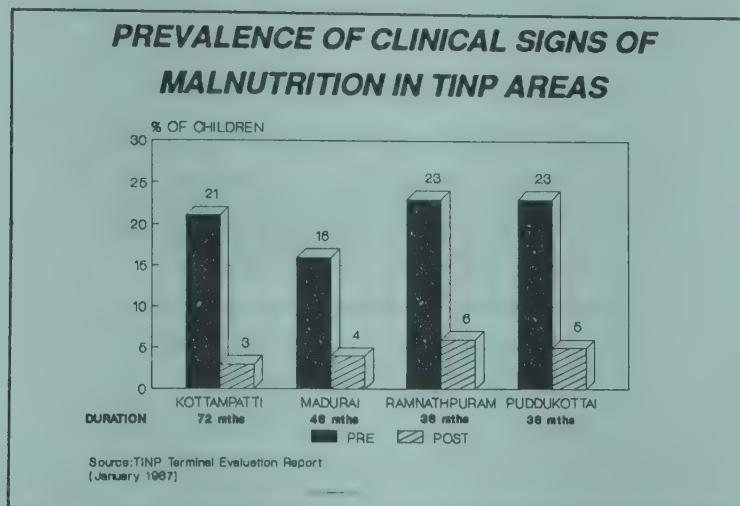
EXHIBIT 2.6

NUTRITIONAL STATUS OF CHILDREN (6-36 MONTHS) IN TINP AREAS



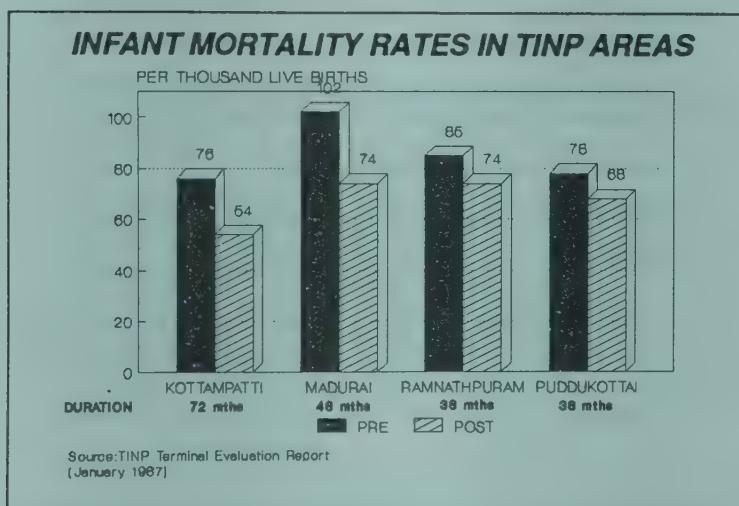
- (iii) The incidence of clinical signs of malnutrition has considerably declined in all the project areas as evident from Exhibit 2.7. In fact the reduction in severe cases of malnutrition clinically manifested is more impressive than the reduction in malnutrition assessed on the basis of weight for age criterion.

EXHIBIT 2.7



- (iv) The Exhibit 2.8 which gives the pre and post intervention Infant Mortality Rates in the project districts indicates that the project impact on IMR has been substantial and the reduction has been of the magnitude of 27-30% in earlier project districts.

EXHIBIT 2.8



2.39 Project coverage in relation to nutrition surveillance, supplementary feeding and provision of health services has also been very good as indicated based on the data compiled by the monitoring wing. The data indicates that:

- (i) More than 90% of children (6-36 months) in the project areas participate in monthly weighing.
- (ii) Close to 23% of children and 15-20% of pregnant and lactating mothers received supplementary feeding under the program.
- (iii) The coverage of eligible children and mothers was very high at 90-95%. The coverage of ineligible children and mothers in the program was low at less than 3.5%.
- (iv) Coverage under Vitamin A prophylaxis and deworming was high at 75 and 80% respectively.

- (v) However, the coverage under the health referral system was poor at 37% of those children who needed to be examined.*
- (vi) Immunisation coverage is fairly low at 35-40% for DPT (3 doses) and 30—40% for polio (3 doses).
- (vii) Percentage of pregnant women getting ante-natal care is 55%, though only a small percentage registers on time.
- (viii) Coverage under TT immunization ranges from 50-75%, FST distribution coverage is 60%. However, most of the women do not use the FST tablets due to gastric irritation.
- (ix) Inspite of increased number of HSCs in the project areas, more than 40-50% of deliveries continue to take place by the untrained dais and individuals. Further, only 50% of children are weighed at birth.

DANIDA ASSISTED HEALTH CARE PROJECT

2.40 The DANIDA assisted Tamil Nadu area project is being implemented in Salem and South Arcot districts of Tamil Nadu since 1981. The overall objective of the project is to improve the health and family welfare status of the rural population of 75 lakhs in these two districts.

2.41 Separate Project Organisation with Project Directorate at State level and District Project officers at district level is functioning. The Project organisation is responsible for planning, implementation and monitoring of the project activities and for co-ordination with other Health and Family Welfare programmes in the execution of the project.

The Strategy adopted by DANIDA

2.42 To achieve the objective of improving the health and family welfare conditions of rural people certain measures were adopted, important ones among them were:-

- (i) Additional health sub-centres, 680 in number were established to ensure one center for every 5000 population.
- (ii) Renovation and remodelling of existing facilities were carried out, in addition to maternity wards, operation theatres, paediatric wards, quarters for female health supervisors etc.
- (iii) Local delivery attendants (Dais) were given training. A number of other training programmes were organised.
- (iv) Under Extended Immunisation Programme several facilities were provided to strengthen cold chain.
- (v) Drinking water facility to 61 HSCs and 735 points of health sub-centres were provided; school urinals, sanitary latrines with water supply facility and soakage pits constructed and buildings and compound wall for PHCs and HSCs were renovated for better functioning.
- (vi) Medical and surgical equipment, refrigerators, deep freezers etc were provided to PHCs and Taluk Hospitals for better functioning.
- (vii) Training equipment were provided and 6 training teams were organised to train health workers in skills and the community in health related issues.

* When a child does not graduate into a normal growth path after 90 days of feeding he is referred to HSC for medical examination

(viii) Monitoring cells to collect data and evaluate performance of the project on various criteria were established.

PROJECT IMPACT

2.43 The Project performance was evaluated by the Department of Evaluation and Applied Research, Madras. The salient findings of the evaluation compared to the baseline survey were as follows:-

	Base Line Survey	Evaluation Study
Ante-natal Registration	32%	63%
T.T. immunization of pregnant women	11	63%
Deliveries conducted by trained persons	42%	62%
Birth rate	30	18
Death rate	11	6.2
Infant mortality rate	135	65
Maternal mortality rate	5	2.4

2.44 The total outlay for the DANIDA project was Rs. 20.08 crores for the first phase which was operative during 1981 to 1989. The second phase of this project at a cost of Rs. 16.26 crores during 1989 to 1992 lays emphasis on infrastructure development and training.

TAMIL NADU GOVERNMENT NUTRITIOUS MEAL PROGRAMME (TNGNMP)

2.45 The TNGNMP was introduced in the state in July/September 1982. The program initially covered pre-school children and children attending class I-V. From 15 September 1984, the Scheme was extended to children attending class 6-10 also. At present there are 23, 483 and 4,840 child welfare centres (includes ICDS and MUDP centres also) functioning in rural and urban areas respectively, benefitting 18.15 lakh pre-school children. Further, more than 64 lakh pupils in the standard I-X are fed through 35,510 school feeding centres, the bulk of which are under the control of Director of School Education.

2.46 The pre-school children and children in class I-V are fed a nutritious meal on all 365 days in a year. The children in class VI-X are fed on school working days. The nutritious meal consists of the following ingredients:-

(units: in Gms)

Item	Pre-school	Standard I-VIII	Standard VIII-X
Rice	80	100	120
Dhal	10	15	15
Oil	3	3	3
Vegetables and condiments	50	50	50

2.47 This meal provides approximately one-third of the calorie and half of the protein requirement for a pre-school child. For the older school going children it provides quarter of the calorie requirement and one-third of the protein requirement. The meal is prepared as a single dish using a variety of local recipes. The cost per meal per day for a child is estimated at 44 paise. The total cost of the project for 1989-90 was estimated at Rs. 195 crores. Children in the age group 2 to 4 are given pre-school training at Community Welfare Centres. Periodic health checkup and immunisation is being done for all pre-school and school going children. CWCs also function as community education centres for mothers in respect of child care and nutrition.

2.48 Since June 1989, an egg is being given to children once in a fortnight. It is proposed to give Vitamin A tablets to all school going children. Iron-fortified salt is also likely to be used in the program to combat anaemia in children. Tooth-powder is currently being distributed to all school going children to promote dental hygiene.

PROJECT IMPACT

2.49 An evaluation of the program carried out by of Sri Avinashilingam Home Science College for Women, Coimbatore at 76 feeding centres covering 3857 children showed that there were definite increases in anthropometric measurements (heights, weights and mid arm circumference) of children in all age groups over a 12 month period. These children fared much better when compared to the ICMR standard. In terms of clinical picture, against only 32% children healthy and free from disease at the time of the commencement of the program, close to 78% were observed healthy at the time of the evaluation.

2.50 A significant increase in the blood haemoglobin levels of children was also observed, although all children continued to remain far below the WHO prescribed norm of 11g/100ml for children. Further, a study of food and nutrient intake of a selected group of children in each category revealed that inspite of a supplementary meal, diets of all children did not meet the Recommended Daily Allowance (RDA) of the ICMR. The primary reason for this was that the noon meal was probably the only major meal for the children and there was no provision for breakfast and only a meagre dinner in their homes. However, the dietary intake of children not covered under the program was much lower, indicating that the program did have a positive impact.

MADRAS URBAN DEVELOPMENT PROJECT (MUDP)

2.51 The MUDP, implemented with the assistance of the World Bank is an integrated programme similar to ICDS to deliver a package of services to children in the age group 6 months to 5 years and pregnant and lactating mothers. At present a total of 219 child welfare centres are being run under this scheme within the city of Madras. The project benefits 12,795 children in the age group 0-5 and 1437 pregnant and lactating mothers. Children below 2 years of age and pregnant and lactating mothers are provided "Sathu" under supplementary feeding programme while the older children in these centres are covered under TNGNMP. 80 pre-schools are now being run under MUDP-II. The annual outlay under this project is Rs.30 lakhs.

FAMILY WELFARE

Demographic Goals and Achievements

2.52 Table 2.9 provides a picture of achievements of Tamil Nadu on family welfare front. Tamil Nadu

got National awards of 2.5 crores for 1984-85 and one crore in 1987-88 in recognition of best performance in family planning. For improving the quality of the programme, accurate maintenance of records in sub centres and regular follow-up service have been emphasised.

TABLE 2.9
GOALS AND ACHIEVEMENTS OF HEALTH PARAMETERS

PER THOUSAND LIVE BIRTHS	TAMIL NADU		INDIA	
	Achievement 1987	Goal 1991-92	Achievement 1987	Goal 2001 AD
Birth rate	23.6	21	32.0	21
Death rate	9.7	9	10.8	9
Infant mortality rate	75	60	95.0	<60
Couple protection rate (%)	52.3	60	39.8	60

Promoting child survival through ante-natal, intranatal and post-natal care, immunisation, diarrhoea management, referral services etc. is emphasised. Communication efforts are expended on raising the age of marriage for the female, prolonged breast feeding and spacing of children.

2.53 Special schemes under family welfare services are given in Table 2.10

TABLE 2.10
SPECIAL SCHEMES UNDER FAMILY WELFARE PROGRAMME

Scheme	Objectives	Coverage/facilities
1.Post Partum Scheme	(a) To improve maternal and child care (b) To provide contraceptive advice (c) To conduct teaching and training programmes to medical staff (d) To detect cases of cervical cancer through PAP smear tests	(a) 3 institutions as centres 9 Teaching hospitals 19 Dist. HQS. hospitals & sub district level hospitals
2.Medical	To extend M.T.P. (Medical Termination of Pregnancy) facilities	280 doctors to be trained in MTP techniques and 288 institutions providing MTP services, Private nursing homes to be approved
3.Urban out-reach Scheme	To extend primary health care approach to urban poor	176 health posts have been established in various towns/cities

CONTROL OF DISEASES

2.54 There are a number of schemes initiated under national programmes aimed at preventing incidences of certain major diseases. These are summarised in Table 2.11

TABLE 2.11

NATIONAL SCHEMES FOR CONTROL OF DISEASES

Program	Objective	Coverage In Tamil Nadu
1. National Leprosy Eradication Programme	Eradication of leprosy by 2000 AD	169 lakh population examined in 1983
2. TB Control programme	Early detection and sustained and regular treatment	1.07 lakh patients detected in 87-88
3. National Malaria Eradication Programme	To bring down incidence of malaria	Madras city and 9 other urban centres. Rural areas of Dharmapuri, North Arcot, South Arcot & Coastal areas of Ramanathapuram
4. Cholera Control Programme	Provide treatment for children and take preventive measures	North Arcot, South Arcot, Coimbatore and Tiruchirapalli
5. National Filaria Control Programme	"	42 night clinics 21 filaria control units with one survey unit in Tiruchirapalli. North Arcot, South Arcot, Chengalpattu and Thanjavur are endemic districts.
6. Goitre Control Programme	To conduct surveys and to establish goitre control cell	5 districts to be surveyed. Presently goitre not considered a problem in Tamil Nadu
7. Aids Surveillance and Control	Surveillance centres established in Madras, Madurai and Vellore Hospitals	
8. National Programme for Control of Blindness	To prevent visual impairment and control of blindness and trachoma	45 health centres and medical colleges in Madurai, Tirunelveli and Thanjavur.

INDIAN MEDICINE AND HOMEOPATHY

2.50 The Directorate of Indian Medicine and Homeopathy is a technical department dealing with

teaching as well as providing health care in the following Indian systems of Medicine and Homeopathy:

- (i) Siddha
- (ii) Ayurveda
- (ii) Unani
- (iv) Naturopathy
- (v) Yoga and
- (vi) Homeopathy

The budget estimate for the Department for 1989-90 was Rs.481.1 lakhs. There are 2 medical colleges for Siddha Medicine, 1 for Homeopathy and one for Unani systems of medicine. Degree and post graduate courses in respective systems of medicines are conducted in these colleges. As on December 31, 1988, there were 13,610 registered doctors from these branches of medicine. Total number of outpatients and inpatients treated under these in 1988 as available in the performance budget 1989-90 were as under:-

	OUTPATIENTS	INPATIENTS
Siddha	51,34,711	1,27,900
Ayurveda	2,01,587	15,505
Unani	90,408	18,343
Homeopathy	4,62,090	4,485

The doctors in these branches of medicine form an important and large segment and many of them belong to families traditionally engaged in medical care. They are popular mostly in the rural areas.

3. Health

3.1 The chapter on the profile of Tamil Nadu highlights an important fact, that the low rate of population growth in the state is due to a combination of low birth rate and high death rate. While the birth rate in Tamil Nadu is substantially lower than the All India average and comparable to states like Kerala, the death rate is fairly high (only marginally lower) than the All India average and far higher than that in Kerala (Table 3.1)

TABLE 3.1
HEALTH INDICATORS – A COMPARATIVE PROFILE – 1986

	INDIA	TAMIL NADU	KERALA
Birth Rate	32.6	23.8	22.5
Death Rate	11.1	9.5	6.1
Life Expectancy at Birth	56.0	55.8	66.6
Infant Mortality	96.4	79.8	27.4

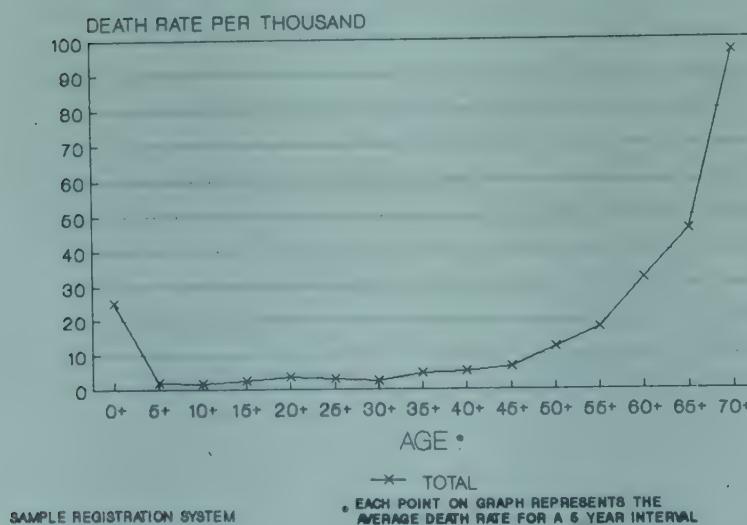
Source: Report of the Expert Committee on population projections based on 1981 Census.

3.2 While part of the reason for lower death rates in Kerala lies in higher life expectancy, lower infant mortality plays a major role. An analysis of age specific death rate for Tamil Nadu also reveals that the death rate is significantly influenced by mortality in infancy and childhood (Exhibit 3.1)

EXHIBIT 3.1

AGE SPECIFIC DEATH RATES IN TAMIL NADU-1986.

ESTIMATED AGE-SPECIFIC DEATH RATES TAMIL NADU-1986



3.3 Against an overall death rate of 9.5 per 1000, the death rate in the 0-5 years age group is 25 per 1000. Putting it more simply, of the 0.5 million deaths in the state in 1986, 0.1 million (20%) were among children below 1 year and 0.05 million (10%) in the age group 1-5 years.

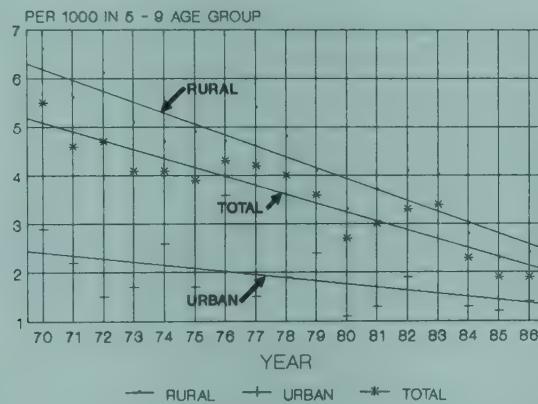
3.4 Against an overall death rate of 25 per 1000 for children in the age group 0-5 years, the death rate among rural children was far higher (29.5 per 1000) than that of urban children (16.5 per 1000). This difference could be due to a variety of reasons like inadequate health infrastructure in rural areas or lack of awareness and concern about health among rural population. It also suggests that there remains substantial scope for reducing the death rates in rural areas.

TRENDS IN DEATH RATES AMONG CHILDREN

3.5 Analysis of trends in death rates among children (0-5 years) indicates that there has been a substantial reduction in death rates since 1970, when the death rate in this age group was as high as 50 per 1000 (Exhibit 3.2). In fact the decline has been higher in rural areas than urban areas, however, death rates still remain much higher in rural areas.

EXHIBIT 3.2 TRENDS IN DEATH RATES AMONG CHILDREN (0-5 YEARS)

**MORTALITY RATES 5-9 AGE CHILDREN IN T.N.
BASED ON SAMPLE REGISTRATION SYSTEM 1986**



3.6 The reasons for this decline are many and are discussed in depth in the latter sections. But primarily they include:

- (i) Extension of health infrastructure to reach rural masses and strengthening of the health referral system. This was achieved by setting up district hospitals, primary health centres (for every 30,000 population) and health sub centres (for every 5000 population).
- (ii) Setting up a State Immunisation Mission which aimed at universal immunisation of all children and pregnant women against six major killer diseases viz.: Polio, Diphtheria, Tuberculosis, Tetanus, Pertussis and Measles.
- (iii) Undertaking campaigns for promoting breast feeding and better home management of diarrhoea, to reduce morbidity and mortality on account of diarrhoea.
- (iv) Recognition of the crucial link between nutrition and health and emphasise on improving the nutritional status of children and pregnant and nursing mothers (through supplementary feeding programmes and special nutrition intervention programmes

like Vitamin A prophylaxis, deworming, iron supplementation) as a means of achieving better health and lower mortality among children.

- (v) Organising grass root level mother and child health care programmes (ICDS, TINP, MUDP etc.) and functionaries (eg. community nutrition workers, multi purpose health workers, anganwadi workers etc.) to achieve extensive coverage under immunisation, nutrition intervention and health programmes.
- (vi) Improving basic sanitation and environment by extending safe drinking water supply and sanitation facilities to reach remote villages.

UNDER 5 MORTALITY RATE (U5MR)

3.7 The U5MR, an index developed by UN Population Division expresses the deaths among children in the age group 0-5 years as a proportion of total live births. For India this index was estimated at 152 in 1987 and the corresponding figure for Tamil Nadu at 123. This means that for every 1000 children born alive in the state, 123 die before the age of 5 years. The U5MR can be further sub-divided into infant (0-1 year) mortality rate (estimated at 76 per 1000 for Tamil Nadu) and child mortality rate in the age group 1-5 years (estimated at the balance 47 per 1000).

INFANT MORTALITY RATE (IMR)

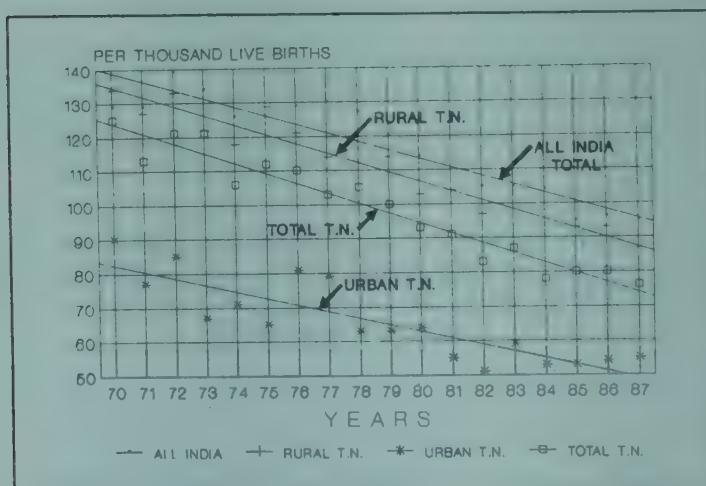
3.8 As seen above, the infant mortality accounts for close to 60% of the under 5 mortality in the state. While the IMR at 76 per 1000 in 1987 is significantly lower than the All India average of 94 per 1000, it remains far higher than that in the neighbouring state of Kerala (27 per 1000). In fact National Policy on Health envisages an achievement of IMR of less than 60 by 2000AD at the All India level.

TRENDS IN INFANT MORTALITY RATE

3.9 Exhibit 3.3 which gives the trends in IMR in urban and rural areas indicates that there has been a significant decline in IMR since 1980s, both in the urban and rural areas.

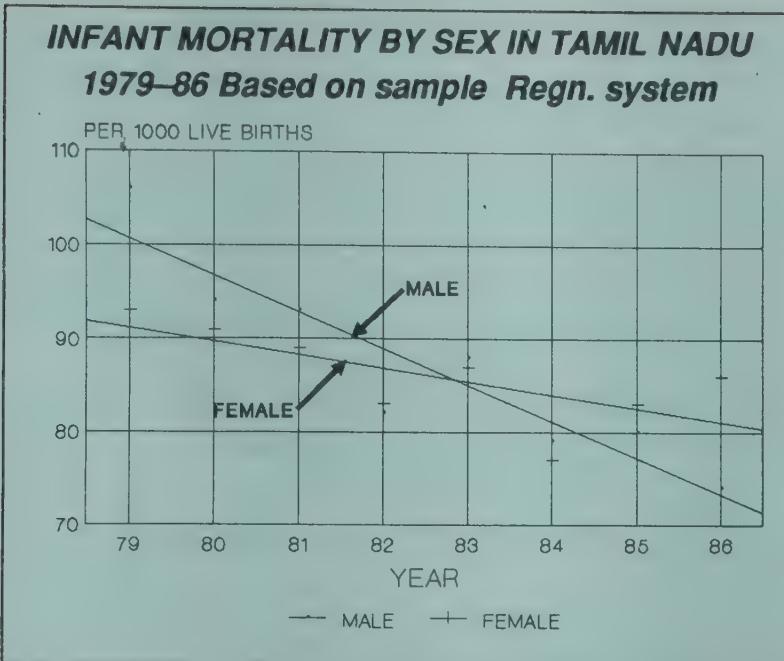
EXHIBIT 3.3

INFANT MORTALITY IN TAMILNADU 1970-87 SAMPLE REGISTRATION SYSTEM



Further the decline in IMR in Tamil Nadu has been higher than at the All India level. However, an analysis of trends in IMR by sex (Exhibit 3.4) indicates that while the IMR

EXHIBIT 3.4



among male children has come down at a significant rate, the female IMR has declined at a much slower rate. This has resulted in reversal of the situation existing in 1980 when male IMR was higher at 96 per 1000 vis-a-vis female IMR of 90 per 1000. In 1986, the male IMR stood at 74 per 1000 vis-a-vis female IMR of 86 per 1000 in Tamil Nadu. This is inspite of the fact that female infants are biologically better equipped for survival than male infants. This may suggest possible discrimination against the female child. Discrimination could be in many forms like poor nutrition, lack of attention and deprivation from medical assistance which costs money. However, a relatively higher death rate among female infants is a symptom of more severe forms of discrimination like female infanticide or total neglect. In fact many studies in the past have pointed out higher mortality rates among female babies (eg.TINP study in 1985, which covered three blocks of Chellampatti, Usilampatti and Sedapatti and a study by CMC, vellore in K.V. Kuppam block). However, none of these studies conclusively points at female infanticide as the possible cause, though practice of female infanticide is widely prevalent and reported among many communities in the state. The Government of Tamil Nadu recognises this as a social problem and is trying to educate these communities against female discrimination through use of mass and folk media.

COMPONENTS OF INFANT MORTALITY

3.10 Infant mortality can be sub-divided into two components. The neo-natal mortality which refers to infant deaths within the first four weeks after birth and the post neo-natal mortality which refers to infant deaths after the first four weeks. The basic rationale for this subdivision is that the endogenous causes of infant mortality like maternal malnutrition and ill health and congenital malformations are supposed to be dominant in neo-natal deaths while the exogenous causes i.e, those which relate to the nature and quality of environment in which these children live, assume greater importance in case of post neo-natal mortality. Table 3.2 gives the components of infant mortality, the factors influencing these and their rates for urban and rural Tamil Nadu.

TABLE 3.2
COMPONENTS OF INFANT MORTALITY

COMPONENT	INFLUENCED BY	RATE FOR TAMIL NADU-1986 - PER 1000 LIVE BIRTHS
1. Neo-Natal	Endogenous factors like: - Maternal malnutrition and ill health - Inadequate ante-natal care - Congenital malformations In addition, certain exogenous factors like: - Place of delivery and type of medical attention at birth - Availability of infrastructure to provide curative care to neo-nates	Rural 67 Urban 37 Overall 57 (72% of IMR)
2. Post Neo Natal Mortality	Exogenous factors like: - Nutrition - Preventive care like immunisation, deworming, Vitamin A prophylaxis etc. - Environmental sanitation and hygiene and availability of safe drinking water etc.	Rural 26 Urban 17 Overall 23 (28% of IMR)
3. Infant Mortality	Combination of 1 & 2 above	Rural 93 Urban 54 Overall 80

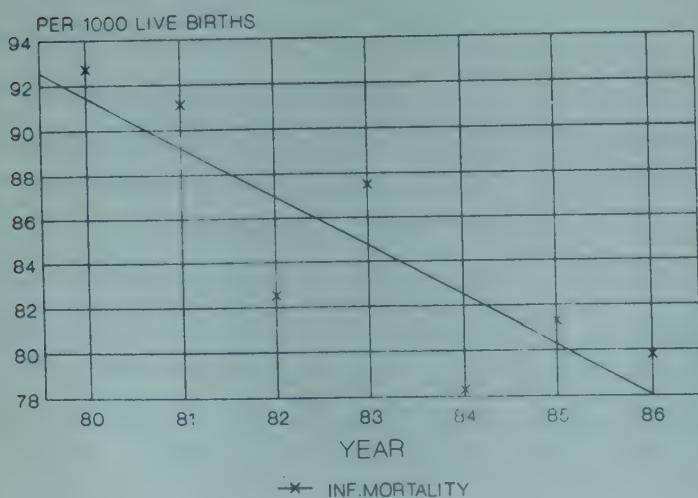
Source: SRS 1986

NEO-NATAL MORTALITY

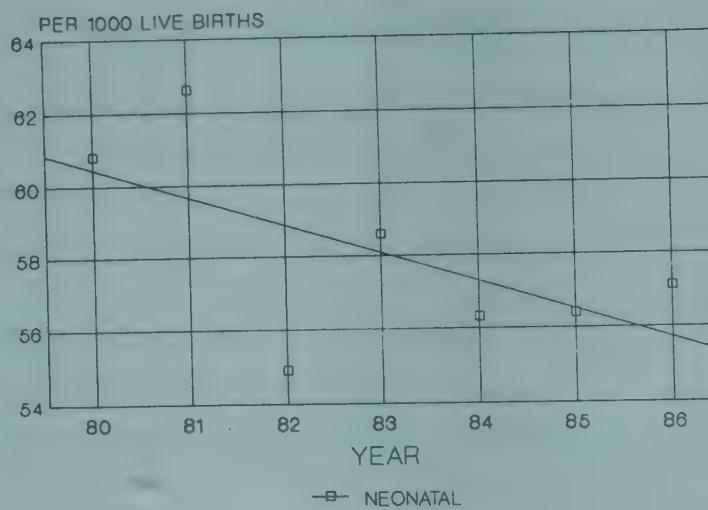
3.11 It is often postulated that as IMR declines, the deaths due to exogenous causes are prevented or eliminated, and the endogenous causes assume relatively greater importance. Also, death due to endogenous causes are supposed to be predominant among neo-natal deaths and hence as IMR declines, the share of neo-natal mortality among infant deaths would increase. In Tamil Nadu the experience has been somewhat similar. As the IMR declined from 125 per 1000 in 1970 to 80 per 1000 in 1986, the proportion of neo-natal mortality to total infant deaths increased from 40% to 70% (Exhibit 3.5).

EXHIBIT 3.5 RELATIVE TRENDS IN INFANT AND NEO-NATAL MORTALITY RATES

INFANT MORTALITY RATE 1980 - 86
BASED ON SAMPLE REGISTRATION SYSTEM



NEO-NATAL MORTALITY RATE 1980 - 86
BASED ON SAMPLE REGISTRATION SYSTEM



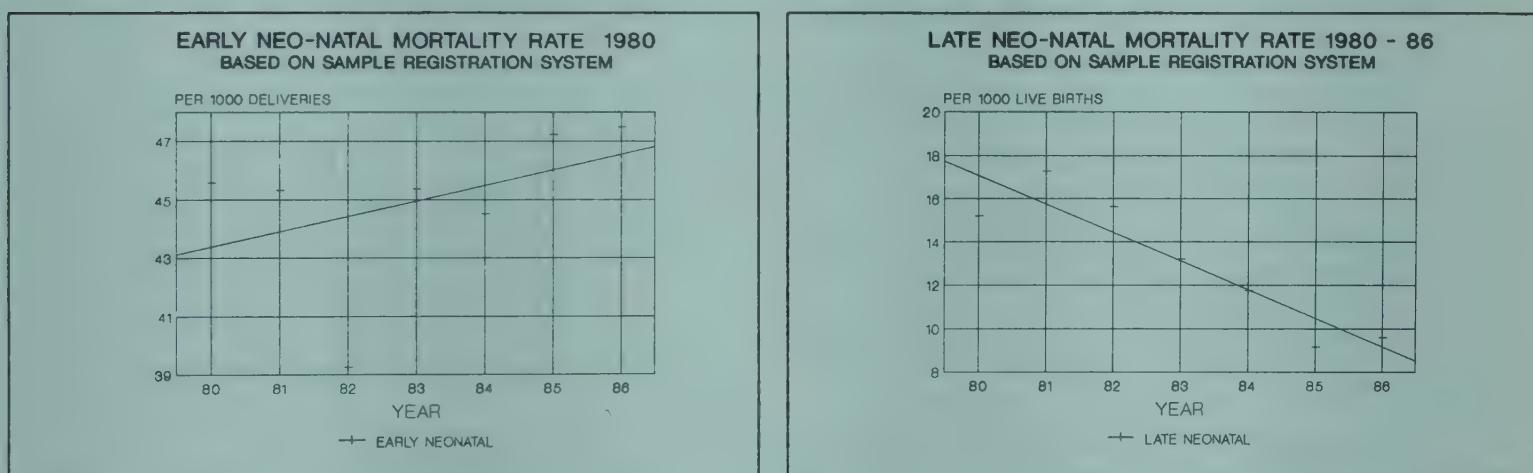
3.12 However, looking at neo-natal mortality more closely, it is revealed that while the late neo-natal mortality (7-28 days) has declined slightly during 1980 to 1986 period, the early neo-natal mortality is showing an increasing trend. (Exhibit 3.6). This increase in absolute terms and not just in relative terms is a cause for concern. In order to understand the factors underlying such an increase a detailed analysis of each of the aspects affecting neo-natal mortality has been attempted in the following sections.

STILL BIRTH RATE AND PERI-NATAL MORTALITY

3.13 Still birth rate (defined as still births per thousand deliveries) is closely related to early neo-natal mortality as with the increasing coverage of health infrastructure and larger number of institutional births it is possible to convert a number of still births to live births. However the subsequent survival of these children depends to a large extent on the availability of specialist neo-natal care.

EXHIBIT 3.6

RELATIVE TRENDS IN EARLY AND LATE NEO-NATAL MORTALITY



3.14 Peri-natal mortality (defined as deaths during the period after 28th week of pregnancy till one week after the birth of the child) includes both the still births and early neo-natal mortality. In view of close relation between still births and early neo-natal mortality and commonly of factors influencing these (Table 3.3) it is important to look at these together.

TRENDS IN PERI-NATAL MORTALITY

3.15 The still birth rate in Tamil Nadu is estimated at 10.4 per 1000 deliveries. In comparison to 1980, the rate remained more or less constant (Exhibit 3.7). However this was a combined result of forces acting in opposite direction.

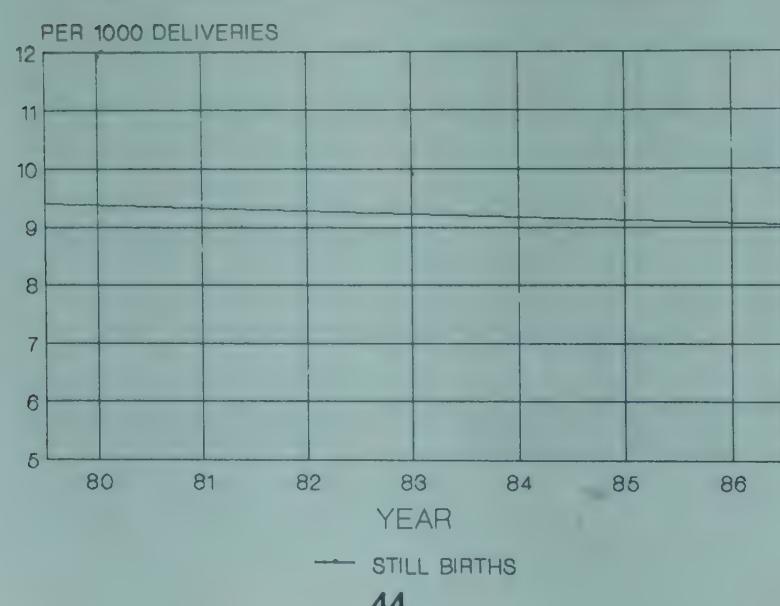
- (i) with the improvement in the coverage of Sample Registration System, lesser number of still births now go unreported.

TABLE 3.3
COMPONENTS OF PERI-NATAL MORTALITY

COMPONENT	INFLUENCED BY	RATE FOR TAMILNADU (SRS 1986)
1. Still Births	Congenital malformations, high risk pregnancies on account of maternal health and nutrition status and pregnancy and delivery complications are the major causes. (i) Maternal nutrition health status (ii) Other factors leading to high risk pregnancies (iii) Skill of the birth attendant (iv) Adequate ante-natal care to avoid pregnancy complications (v) Delivery complications	Rural 11.4 Urban 8.5 T.N. 10.4 per 1000 Deliveries (18.8% of PNMR)
2. Early Neo-natal (0-7 days after birth) Mortality Rate	LBW, birth asphyxia, neo-natal tetanus, diarrhoea, infections of the new born, birth injury and female infanticide are the main causes Maternal nutrition and health, place of delivery and consequent ability to handle delivery complications, adequate ante-natal care, infrastructure to provide curative care to neo-nates, skill of the birth attendant etc.	Rural 52.3 Urban 28.6 Total 44.5 Per 1000 live births (81.2% of PNMR)
3. Peri-natal Mortality Rate	A combination of 1 & 2	Rural 64.3 Urban 37.3 Total 55.4 Per 1000 deliveries

(ii) With increasing of health infrastructure and larger number of births being attended to by trained professionals, a number of still births are now converted to live births.

EXHIBIT 3.7
STILL BIRTH RATE 1980 - 86
BASED ON SAMPLE REGISTRATION SYSTEM



— STILL BIRTHS

3.16 Against this the early neo-natal mortality in Tamil Nadu has gone up, even in absolute terms (Exhibit 3.8). The most important reason to which experts attribute this is the fact that with larger number of institutional deliveries, a number of still births are getting converted to live births. However these children subsequently die during neo-natal period due to lack of specialist neo-natal care. In recent years, a low cost neo-natal care project has been set up at Kanchipuram with aid from the Ford Foundation. The project has achieved notable success in lowering the neo-natal mortality from 43 to 36 per 1000 in a short span of 1 year.

DEFINITIONS

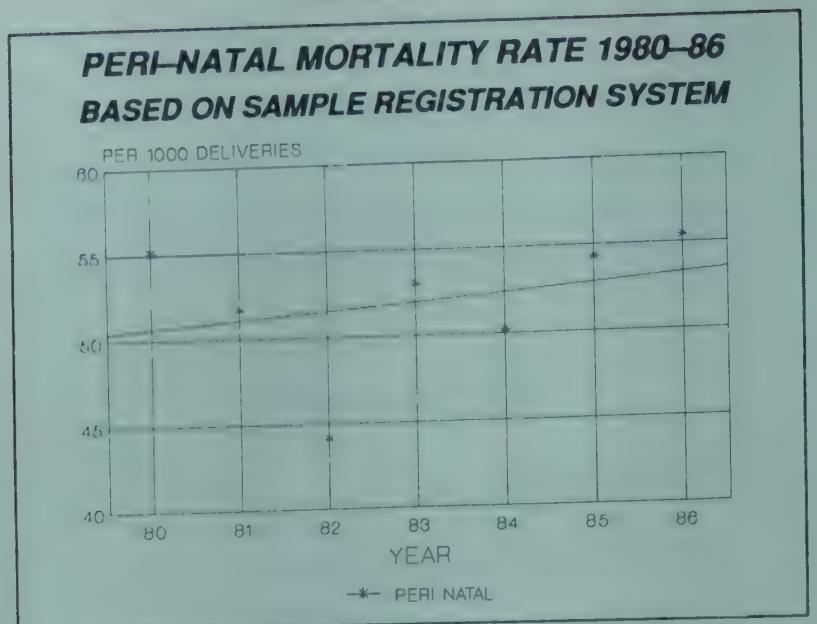
<i>Infant Mortality Rate:</i>	Deaths of children < 1 year per 1000 live births.
<i>Still Birth Rate:</i>	Still births per 1000 deliveries.
<i>Peri Natal Mortality:</i>	Infant deaths after the 28th week of pregnancy and between 0-7th day of birth per 1000 deliveries.
<i>Early Neo Natal Mortality:</i>	Infant deaths from 0–7 days of birth per 1000 live births
<i>Late Neo Natal Mortality:</i>	Infant deaths from 7-28 days after the birth per 1000 live births.
<i>Post Neo Natal Mortality:</i>	Infant deaths after 28 days but before 1 year per 1000 live births.

CAUSES OF DEATH IN PERINATAL PERIOD

3.17 Congenital malformations, pregnancy and delivery complications are the major causes of still births whereas prematurity, low birth weight, birth asphyxia, neo-natal tetanus, birth injuries and diarrhoea of the new born are the major causes of death in the neo-natal period.

3.18 An analysis of causes of deaths in the early neo-natal period based on data from all teaching hospitals in Tamil Nadu (Table 3.4) reveals that 45% of deaths in the state occur on account of prematurity. Respiratory and diarrhoeal infections of the new born account for another 25% of deaths. These can be primarily attributed to the environment and secondly to the type of medical attention at birth and the new born health care practices followed in the state. Cord infections, birth injury and malposition account for another 10% of deaths. The deaths due to these causes is likely to be far higher in rural areas (teaching hospitals essentially reflect the urban data) as larger number (close to 50%) of births in rural areas are conducted by untrained dais in unhygienic surroundings. Congenital malformations which are due to endogenous causes and non-preventable, contribute to only 3% of neo-natal deaths. Deaths due to neo-natal tetanus is almost absent in the state due to extensive coverage under TT Immunisation programs for pregnant women.

EXHIBIT 3.8



**TABLE 3.4
SPECIFIC CAUSES OF NEO-NATAL DEATHS-1988
(URBAN DATA FROM ALL TEACHING INSTITUTES)**

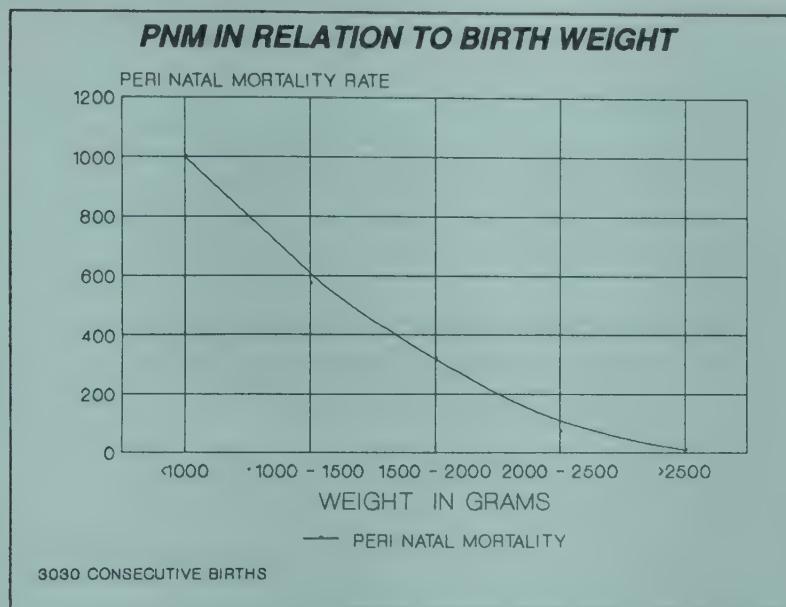
CAUSES	PERCENTAGE
1. Prematurity	45.3
2. Respiratory Infection of new born	15.5
3. Diarrhoea of new born	8.9
4. Cord Infection	5.8
5. Congenital malformation	2.6
6. Birth Injury	1.9
7. Malposition	1.0
8. Others	19.0
	<hr/>
	100.0

PREMATURITY AND LOW BIRTH WEIGHT

3.19 It is estimated that pre-term and low birth weight (< 2.5 kg) infants together form 25-30% of total deliveries in Tamil Nadu. In fact, the exact estimates for incidence of LBW (including pre-term) is not available due to non-recording of weight at birth. Many community based/hospital studies are available, but their estimates vary from 18 to 47% depending on the sample (See Chapter on Nutrition for details).

3.20 A study of 3030 consecutive births by Dr. Santhanakrishnan in a Madras hospital reveals that the peri-natal mortality reduces significantly with increase in birth weight (exhibit 3.9). Recent ICMR study also indicates a much higher PNMR of 109 for LBW infants against 35 for normal infants.

EXHIBIT 3.9
PERI-NATAL MORTALITY IN RELATION TO BIRTH WEIGHT



3.21 Maternal malnutrition, inadequate diet during pregnancy, wide spread prevalence of iron deficiency anaemia (blood haemoglobin levels directly affect the foetus growth during the third trimester of pregnancy), teenage pregnancies and plural births are some of the important causes of higher incidence of low birth weight in the state.

BIRTH ASPHYXIA AND RELATED COMPLICATIONS

3.22 Though it has not been adequately reflected in the data presented in Table 3.4, according to an estimate birth asphyxia accounts for a very significant proportion of neo-natal deaths. Birth asphyxia is more common among pre-term infants (incidence rate among pre-term infants is 160 per 1000 live births, twice that, observed for the term infants) and hence to certain extent those deaths are reflected in pre-term deaths. The case fatality rate is high in birth asphyxia at 36%. Trained medical attention at birth and availability of special equipments like foetoscope (to detect foetal stress), ambu bags, resuscitation kits and mucous bulbs could go a long way in lowering deaths on account of birth asphyxia.

CONGENITAL MALFORMATIONS

3.23 Congenital malformations are overshadowed by numerically more important causes of death including low birth weight and birth asphyxia. Based on a study of 24,000 consecutive births at Stanley Hospital by the Institute of Social Paediatrics, the incidence rate of congenital malformations is estimated at 18 per 1000 deliveries. Of this close to 28% are still born and another 26% die during the early neo-natal period. Neural tube defects (32%), gastro-intestinal abnormalities (16%), chromosomal defects including Downs syndrome (12%), congenital heart disease (12%) and skeletal malformations (12%) are some of the commonly observed malformations.

3.24 In Tamil Nadu consanguineous marriages are a common phenomenon as the practice of marrying maternal uncles or first cousins is quite popular. This could contribute to congenital abnormalities. However, according to a study conducted at KG Medical College, there is no significant relationship between consanguineous marriages and congenital malformations.

CAUSES RELATED TO DELIVERY PRACTICES

3.25 These account for close to 10% of neo-natal deaths in urban Tamil Nadu. As discussed earlier, large number of non-institutional births handled by traditional dais and relatives and the delivery practices followed by them are the major factors responsible for deaths on account of these (see Box for details). Naturally deaths due to these causes are higher in rural areas than urban areas.

DIARRHOEA OF THE NEW BORN

3.26 Diarrhoea of the new born is essentially a colostrum deficiency syndrome. The practice of discarding colostrum is widely prevalent in the state (as discussed in detail in the chapter on Nutrition). Only 30% of mothers breast feed their infants on Day 1. This is further aggravated by the practice of giving pre-lacteal feeds like honey, sweetened water etc. These practices coupled with poor environmental and personal hygiene affect the new born in terms of diarrhoea or respiratory infections. In fact deaths due to these causes has been on an increase in recent years.

DELIVERY AND HEALTH CARE PRACTICES

An ICMR study in 8 centres in the country reveals:

- In 55% of rural births and 22% of urban births unsterilised instruments were used despite the awareness for need to sterilise these before use.
- In 45% of both urban and rural births, the hands were never washed before touching the infant.
- In 2% of urban births and 9% of rural births dry/rusted scissors or old blades were used for cutting the cord. In another 6% of urban and 46% of rural births a new unsterilised blade was used.
- Most frequently used cord application in rural areas was a mixture of ghee and haldi and ashes which were used in almost 21% of cases. Cowdung was used in 9% of cases.
- In 63% births in urban areas and 80% in rural areas no dressing, was applied for the cord.
- Thread remained the most commonly used material for tying the umbilical cord and was used in 90% of cases. A rag was used in 7% of rural and 4% of urban births. Rubber bands and clamps were used in 2% of cases.
- In 47% of rural deliveries and 24% of urban deliveries, the thread used for tying was not sterilised.
- For cleaning the infants mouth at birth, in urban areas clean gauze pieces were most commonly used (54%), finger without any cloth was the next frequent mode (30%), followed by dirty cloth (9%). Suction was used in only 6% of cases.
- In rural areas 65% used only finger for cleaning the mouth, followed by dirty cloth (25% of cases) and gauze piece (8%). Suction as a method of cleaning the mouth was totally absent.
- In rural areas 40% were not given bath within first 24 hours.

MATERNAL MORTALITY RATE

3.27 The number of maternal deaths during or within thirty days after the delivery for every 1000 deliveries is termed as maternal mortality rate (MMR). Civil Registration System estimates the maternal mortality rate at 2.3 per 1000 deliveries in rural areas and 1.1 per 1000 deliveries in urban areas for 1986. The DANIDA terminal evaluation estimates the MMR at 2.4 in rural areas of Salem and South Arcot district. At the all India level the MMR is higher at 3. The National Policy on Health envisages an MMR of 2 per 1000 deliveries by 2000 AD.

CAUSES OF MATERNAL MORTALITY

3.28 On the basis of data from teaching hospitals in Tamil Nadu in 1988, causes of maternal deaths have been analysed (Table 3.5). Almost one fourth of maternal deaths are due to anaemia which reflects wide spread malnutrition and acute iron deficiency. Pregnancy complications like toxemia and bleeding during pregnancy and delivery complications like breach or malposition of the child and post partum fever together contribute to a third of maternal deaths.

TABLE 3.5

CAUSES OF MATERNAL MORTALITY

CAUSES	PERCENTAGE MATERNAL MORTALITY
Anaemia	23.1
Bleeding of pregnancy and puerperium	15.9
Abortions	11.5
Malposition of the child leading to death of mother	7.7
Toxemia	6.7
Others	21.1

Source: Directorate of Medical Education, Tamil Nadu - 1988

3.29 Pregnancy complications are quite common in the state. According to DANIDA terminal evaluation estimates, 7-8% of pregnant women encountered pregnancy complications. Oedema, blood pressure and albumin in urine were most commonly observed. Toxemia and bleeding during pregnancy were also observed. These most frequently led to maternal deaths. Of the women who suffered from pregnancy complications only 75% sought medical help.

3.30 Delivery complications were observed in 4% of cases. Post Partum haemorrhage or fever, premature delivery and prolonged labour were most commonly observed complications. In case of these complications close to 88% of mothers sought medical help. However, frequently it was too late by then leading to either maternal or infant death.

3.31 Pregnancy and delivery complications are a result of a number of complex, inter-related factors which include maternal malnutrition and ill health, inadequate ante-natal care (including immunisation against Tetanus), place of delivery and type of medical attention at birth etc. In fact adequate ante-natal care, together with identification of high risk pregnancy and their referral to appropriate institutions could go a long way in lowering maternal mortality on account of these complications.

3.32 In Tamil Nadu, the coverage under TT immunisation program has been fairly extensive (estimated at 83% of eligible women). This reflects clearly in terms of almost nil death on account of tetanus during pregnancy. In the states like UP and Bihar which have had limited success with TT immunisation programme, tetanus continues to account for 60% of maternal deaths and MMR remains far higher.

MATERNAL FACTORS

3.33 Many biological, nutritional and health factors relating to the mother affect the birth weight of infants and the chances of their survival during the peri-natal period. These factors include:

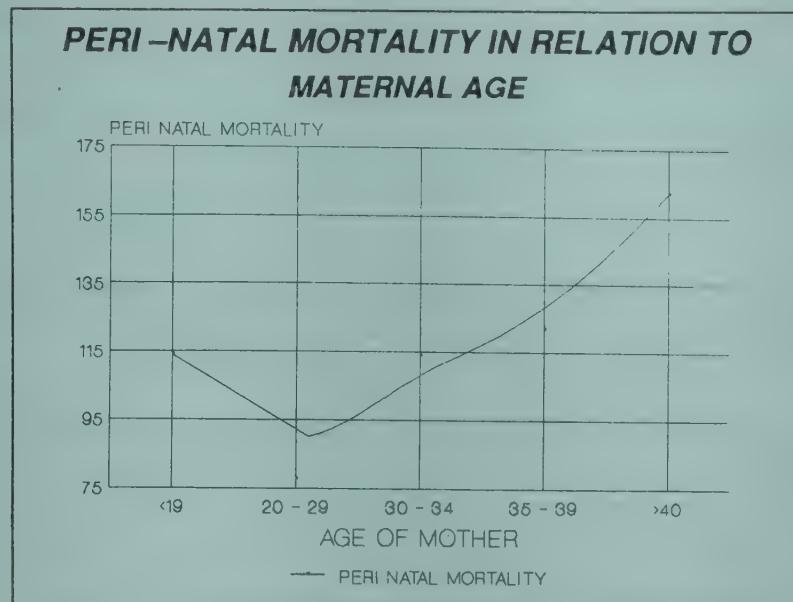
- maternal age
- parity
- spacing
- maternal malnutrition
- maternal illness and
- pregnancy complications.

MATERNAL AGE

3.34 Maternal age below 20 and above 30 have been known to affect the birth weight of infants and peri-natal mortality. A very young mother is biologically not fully mature, therefore the probability of pregnancy related complications is high. In Tamil Nadu, it is estimated that 25% of girls in the age group 15-19 years are married and almost a fourth of these get pregnant every year. Thus there are 180000 teenage pregnancies in the state every year. The problem of teenage marriages and pregnancies is specially acute in Dharmapuri, North Arcot, South Arcot, Salem and Chengalpattu.

3.35 Beyond the age of 30, the risk of pregnancy complications apparently increases because of increasing inflexibility of female reproductive organs. A study at the Institute of Child Health reveals a J shaped curve for PNMR (Exhibit 3.10) in relation to the age of the mother with the rate being the lowest in the age group 20-29 years.

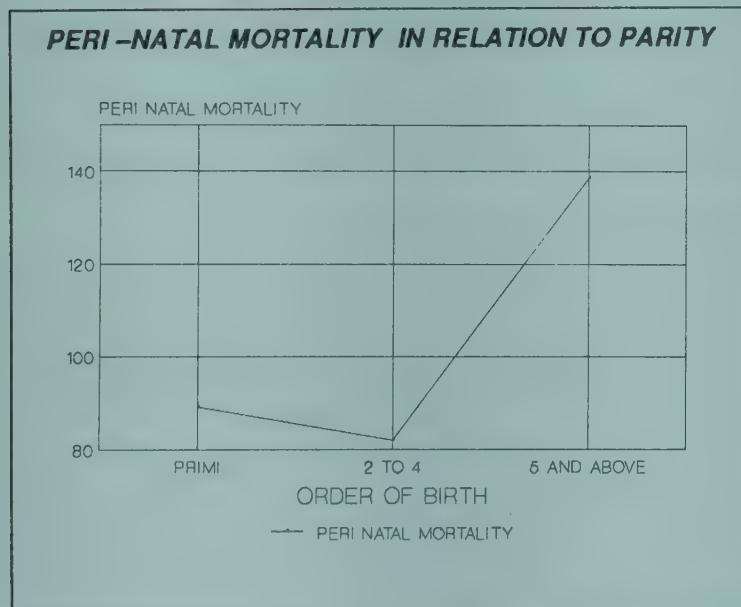
EXHIBIT 3.10
PERI-NATAL MORTALITY IN RELATION TO THE AGE OF THE MOTHER



PARITY

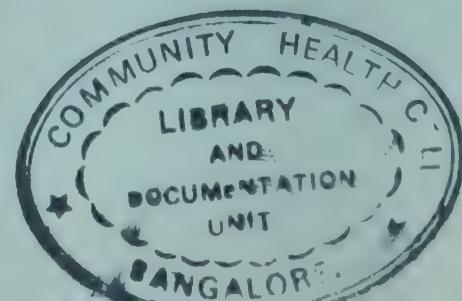
3.36 Exhibit 3.11 which illustrates the relationship between the PNMR and the parity as observed during a study at the Institute of Child Health, Madras, indicates that the higher order births (4th child and beyond), face a substantially higher PNMR. A study by ICMR also observed that multi para births in urban slums and multigravida (4 and above) births in rural areas faced a substantially higher PNMR.

EXHIBIT 3.11
PNM IN RELATION TO PARITY



3.37 According to a study on levels, trends and differentials in fertility, done in 1979, 36% of births in rural Tamil Nadu and 30% in urban areas belonged to 4th order and above. Thus a substantial proportion of pregnancies in Tamil Nadu would face higher risk of adverse pregnancy outcome on account of parity. The family planning programme besides achieving lower population growth, could make a significant contribution in lowering the peri-natal mortality.

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Spacing of births

3.38 World fertility survey in 29 countries revealed that the children born after the interval of three or more years had lesser risk of mortality. Although there is no data available on spacing of births in Tamil Nadu, the 1981 Census indicates that close to 13% of women under the age of 24 years had more than three children. This indicates inadequate spacing and affects the maternal and infant mortality.

Maternal Malnutrition

3.39 Maternal malnutrition affects both the endogenous foetus and the new born by way of low birth weight, inadequate stores of nutrients in the new born and slow growth during lactation. In Tamil Nadu, a large percentage of pregnant women are stunted (height < 140 cm) and underweight (weight < 40 kg). This is the result of inadequate nutrition of the girl during the adolescent period. The low haemoglobin level in the blood (<8 g%) and the resultant anaemia are also very common among women in Tamil Nadu (it is estimated that 60-80% of pregnant women suffer from anaemia during their third trimester of pregnancy). In a study conducted by ICMR in Madras slums, all these factors showed a strong correlation with the peri-natal mortality (Exhibits 4.19, 4.20 and 4.21 in the Nutrition chapter).

3.40 The Government recognises this crucial linkage between mother's nutritional status and chances of child survival. The supplementary feeding for pregnant and nursing mothers and iron supplementations are an integral part of all the grass root level mother and child health care programmes operating in the state (ie. TINP, ICDS, DANIDA, MUDP etc.). However the coverage of eligible women under supplementary feeding programmes remains poor (20–25%) and needs to be improved. Further, though coverage under FST distribution programme is high at 80%, in actual practice very few women consume these tablets due to lack of knowledge regarding anaemia and the tendency of these tablets to cause gastric irritation. In Tamil Nadu, the state Government has also introduced a programme of feeding school going girls (under TNGNMP) to ensure their adequate growth during adolescent years.

Maternal ill health and Pregnancy Complications

3.41 Maternal ill health in terms of history of diabetes, hypertension, heart disease, jaundice and anaemia and pregnancy complications like pregnancy induced hypertension, oedema, eclampsia and antepartum haemorrhage (APH) influence pregnancy outcome and peri-natal mortality. Bad obstetric history in terms of long period of infertility, repeated abortions, previous still births and neo-natal deaths, history of caesareans, craniotomy, post partum haemorrhage, manual removal of uterus, malpresentation and breech have also been identified as high risk factors increasing chances of adverse pregnancy outcome.

ANTE –NATAL CARE

3.42 Ante-natal care which comprises immunisation against tetanus, supplementary feeding and iron supplementation during the third trimester of pregnancy and regular health check ups and referral in case of pregnancy complications can go a long way in improving the maternal health and nutritional status and reduce the chances of peri-natal mortality. According to a study done by the Institute of Social Paediatrics in 1983, among the 45%

of mothers (total 11,000) who received ante-natal care, the peri-natal deaths were low accounting for 8% of the total.

3.43 While a number of mother and child health care programmes have been operating in the state (namely ICDS, TINP, MUDP and DANIDA) since 1980s with the stated objective of provision of ante-natal care for pregnant women were, the coverage under these programmes has been poor. In TINP areas only 52% of eligible women registered for the programme of which only 20% had any pre-natal checks. Further, only 8% of women registered on time. Even in DANIDA project areas where health infrastructure has been expanded to ensure extensive coverage, the ante-natal registration remains poor at 63%.

IDENTIFICATION OF HIGH RISK PREGNANCIES

3.44 As discussed in the earlier sections, there are a number of maternal health and nutrition related factors which have empirically high risk factors contributing to adverse pregnancy outcome including maternal and peri-natal mortality. According to an estimate, close to 20% of pregnancies in India are such high risk pregnancies. What is urgently required is to increase the coverage under the ante-natal care programmes and to identify the high risk pregnancies so that they can be referred to appropriate institutions. The grass root level Auxiliary Nurse Midwives (ANMs) and Traditional Birth Attendants (TBA) could undertake this task. Currently due to poor coverage under ante-natal care programme and the practice of calling TBAs only during labour, such high risk pregnancies go unattended till the time of actual delivery, when it is too late to take any remedial action.

EXOGENOUS FACTORS

3.45 Besides the number of endogenous factors affecting peri-natal and maternal mortality, there are a few exogenous factors like the place of delivery, the skill of the birth attendants and the facilities available for the curative care of neo-nates which significantly influence the pregnancy outcome.

PLACE OF DELIVERY AND TYPE OF ATTENTION AT BIRTH

3.46 Information about the place of delivery and type of attention at birth are available from Sample Registration System. The births are classified into four categories. All births which take place in hospitals/nursing homes are categorised as institutional. All domiciliary births are classified according to whether they are attended by trained professionals, untrained professionals or others which includes relatives etc. Exhibit 3.12 which provides information on distribution of births by type of medical attention at birth indicates that in Tamil Nadu, 49% of births in rural areas and 10% in urban areas are attended to by untrained professionals and family members. Though this is far lower than the All India average of 68% in rural areas and 27% in urban areas, it leaves a substantial cause of concern.

3.47 Further, of the total infant deaths recorded in Tamil Nadu (under SRS), close to 65% were in the hands of untrained personnel compared to about 40% deliveries which were conducted by these people. In rural areas in fact 72% of infant deaths were in the hands of untrained personnel while the percentage was lower at 28% in urban areas (Exhibit 3.13).

EXHIBIT 3.12

**PER CENT DISTRIBUTION OF SAMPLE BIRTHS
BY TYPE OF MEDICAL ATTENTION AT BIRTH**

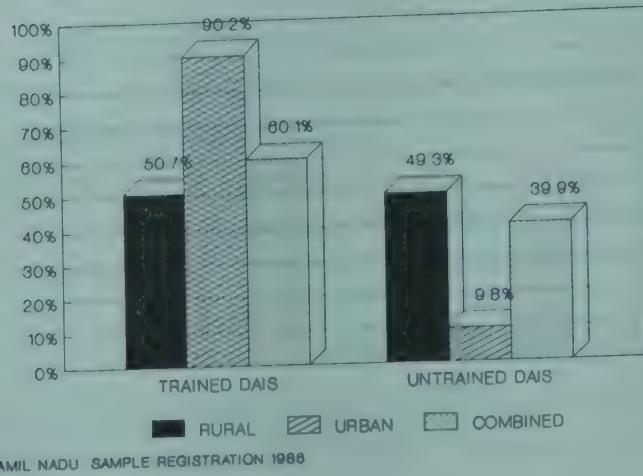
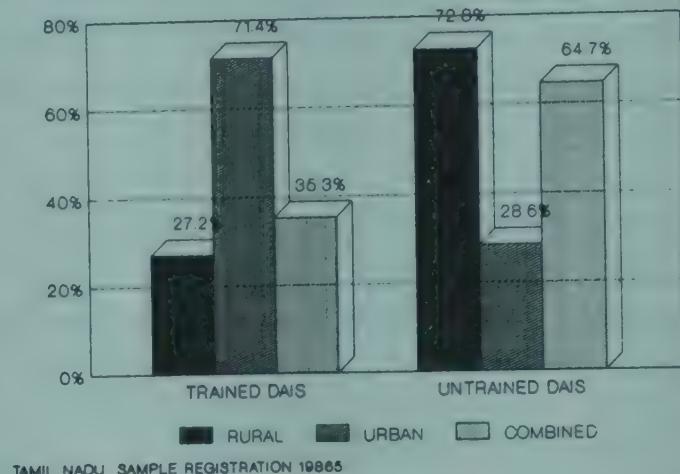


EXHIBIT 3.13

**PER CENT DISTRIBUTION OF SAMPLE DEATHS
BY TYPE OF MEDICAL ATTENTION BEFORE DEATH**



ROLE OF TRADITIONAL BIRTH ATTENDANTS (TBAs)

3.48 According to SRS 1986, even today, in rural Tamil Nadu close to 28% of deliveries are being conducted by traditional birth attendants in primitive conditions (see Box). According to an estimate, there are close to 40,000 practising TBAs in the state.

3.49 Inspite of poor skills and unhygienic practices, TBAs play an important role in rural communities. This situation is unlikely to change drastically in the next decade. In view of this, it would be important to impart necessary training to them to improve their skills and practices. The training should include identification of high risk pregnancies and their referral to medical institutions, actual technique of conducting delivery and resuscitation of new born babies, use of sterilised instruments and post natal care of the mother and the child. In fact the Government of Tamil Nadu (DPH) and DANIDA have undertaken a programme of training and motivating these traditional birth attendants. Coverage under this programme has, however been limited till date.

3.50 It would be useful if at the end of the training these TBAs are provided basic equipment like foetoscope, mucous bulb, ambu bag, enema can, scissors, sterilising equipment, catheter, cord clamps, forceps etc. This would go a long way in ensuring hygienic delivery practices.

3.51 Currently, a large number of deliveries are being conducted at home by relatives. This practice should be discouraged by more active involvement of ANMs and TBAs in seeking out the delivery cases. Under the DANIDA project, a large number of disposable delivery kits were provided to expectant mothers in the third trimester as a method of preventing sepsis in cases of domiciliary deliveries. However, the evaluation survey indicated that only 8% of women actually used the kit at the time of the delivery.

PRACTICES OF TRADITIONAL DAIS IN TAMIL NADU

In rural areas of Tamil Nadu, a strong tradition of village midwife still exists. The tradition persists as the new generation of dais (usually from barber or dhobi community) are inducted with these skills by their mother-in-laws. Usually these dais are contacted once the labour begins and are not paid any monetary compensation. The delivery is conducted with household materials like kitchen knives for cutting the umbilical cord, turmeric/ash/cowdung for the application on the navel of the baby etc. They are not aware of the concept of asepsis or sterilisation. Further these dais do not know the skill of palpating the abdomen to identify foetal parts, monitoring the foetal heart or performing the pelvic examination to study the cervical dilation. As a result, they cannot identify the pregnancy complications and foetal distress in labour. Thus very often at the end of prolonged labour they realise they cannot handle the case by which time it is too late to go to district hospitals.

CURATIVE CARE FOR THE NEO-NATES

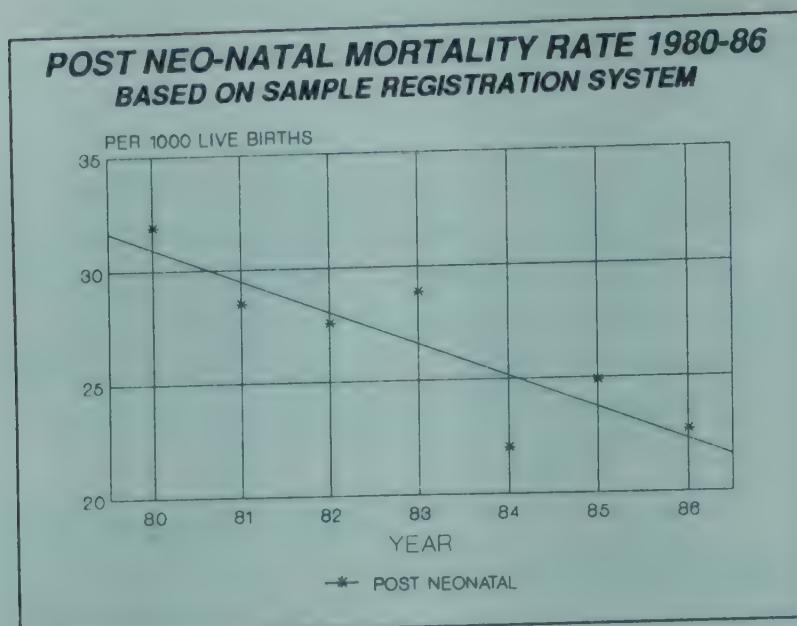
3.52 As discussed earlier the neo-nates in general and neo-nates who are premature or are low birth weight in particular need specialist attention and care for their survival. Equipments like photo therapy units, warming arrangements, resuscitation equipment and ambu bags are necessary for their survival. The existing health infrastructure in rural areas (PHCs and taluk/ district hospitals) are lacking in these facilities. These hospitals also need to be staffed with paediatrician/neonatologist who have experience in this field. In fact, in view of the large number of pre-term (4-8%) and low birth weight (18-25%) babies in the state, this 'WARM CHAIN' assumes as much importance as the 'COLD CHAIN' in immunisation.

POST NEO-NATAL AND UNDER FIVE MORTALITY

3.53 Post neo-natal mortality which represents infant deaths between 28 days and one year after the birth per 1000 live births is estimated at 23 per 1000 in Tamil Nadu. In rural areas the rate is much higher at

26 vis-a-vis 17 in urban areas. Post neo-natal mortality accounts for close to 28% of infant deaths. Against this under 5 mortality is estimated at 123 per 1000. The mortality in the age group 1-5 years is estimated at 47 per 1000.

EXHIBIT 3.14



TRENDS IN POST NEO-NATAL MORTALITY

3.54 This has shown a significant decline since 1980s (Exhibit 3.14). In fact, a substantial part of the decline (75%) in IMR can be attributed to decrease in post neo-natal mortality. Even the under 5 mortality has declined to 123 per 1000 in 1987.

UNIVERSAL IMMUNISATION PROGRAMME

3.55 Universal immunisation of children and pregnant women has been recognised as a crucial intervention strategy for reducing infant and child deaths caused due to six major childhood diseases viz.

Diphtheria

Pertussis (Whooping cough)

Tetanus

Poliomyelitis

Tuberculosis and

Measles.

3.56 Though immunisation of pregnant women against tetanus was in vogue since the 1950s the immunisation of infants against Diphtheria, Pertussis, Tetanus and Tuberculosis were introduced only during the 1970s (Table 3.6). In 1978 under the Expanded Programme on Immunisation (EPI), Oral polio vaccines were introduced in Tamil Nadu and the coverage of the programme was increased through its inclusion in grass root level mother and child health care programmes. In 1985 measles vaccine was included in EPI. In 1985-86, the immunisation programme was further expanded to achieve universal immunisation of all infants and pregnant women.

TABLE 3.6
EVOLUTION OF IMMUNISATION PROGRAMME IN INDIA

YEAR	DETAILS ON IMMUNISATION PROGRAMME
1950	Tetanus Toxoid to expectant women
1970	Diphtheria, Pertussis and Tetanus (DPT) Vaccine administered as part of MCH
1978	Expanded Programme on Immunisation (E.P.I.) DPT, Oral Polio Vaccine (OPV), DT, TT10 and TT16.
1985	Measles vaccine was included in EPI.
1985-86	Universal Immunisation Programme (UIP) - Supported by UNICEF - Intensive district by district approach instead of State wide approach.

3.57 Some of the key features of Universal Immunisation Programme include:

- (1) Intensive district coverage approach rather than state-wide partial coverage.
- (2) Emphasis on full and complete immunisation.

IMMUNISATION SCHEDULE			
BENEFICIARIES	AGE	VACCINES	NO.OF DOSES
Infants	6 weeks	DPT	3
	9 months	(Diphtheria, Pertussis, Tetanus)	
	"	OPV (Oral Polio Vaccine)	3
	"	BCG (TB)*	1
Children	9-12 months	Measles	1
	16-24 months	OPV Booster	1
	"	OPV Booster	1
Pregnant women	16-36 weeks of pregnancy	TT (Tetanus Toxoid)	1**

* For institutional deliveries BCG should be given at birth.
 ** 2 doses if not vaccinated previously

- (3) Inclusion of universal immunisation as an integral part of all MCH programmes.
- (4) Ensuring adequate availability of full complement of vaccines at the grass root level.
- (5) Emphasis on cold chain maintenance for preservation and transportation of vaccines to ensure their effectiveness (specially for OPV and measles vaccines which are highly thermolabile).

3.58 In Tamil Nadu, UIP was implemented in 5 phases during the 1985-86 to 1989-90 period. The phase wise coverage of districts was follows:

Phase I : Madurai, Anna, Salem

Phase II: Coimbatore, Periyar, Thanjavur

Phase III: North Arcot, Dharmapuri, South Arcot, Chengalpattu.

Phase IV: Ramnad, P. Muthuramalingam, Tirunelveli, Chidambarnar

Phase V: Kanyakumari, Kamarajar, Pudukottai, Trichy and Madras.

Table 3.7 gives estimated number of beneficiaries covered under the programme in 1988-89. The percentage coverage based on this data comes out to be fairly high ranging between 80-92%.

TABLE 3.7
ESTIMATED NUMBER OF BENEFICIARIES AND COVERAGE
UNDER THE UIP PROGRAMME 1989-90

VACCINATION	ACHIEVEMENT %	
	NO. IN LAKHS	COVERAGE
D.P.T.	11.05	91
Polio	10.85	89
BCG	11.92	92
Measles	10.67	88
T.T. (Mothers)	10.53	79

3.59 Against this the Directorate of Public Health, Tamil Nadu estimates extent of coverage under immunisation to be far lower as shown in Table 3.8.

3.60 An evaluation of UIP carried out by the Department of Evaluation and Applied Research (DEAR) in 1988 revealed that the coverage of DPT and OPV varies from district to district. In Dharmapuri (HUD) the coverage was the lowest at 35% while in Madurai HUD it was the highest at 84%. This must be viewed in the context of the fact that the UIP was implemented in Dharmapuri district only in 1987-88 and that there have been no grass root level MCH programmes operating in the district. On the other hand Madurai has the benefit of the early

implementation of the UIP since 1985-86 and functioning of many MCH programmes in the district including TINP and ICDS. The UIP evaluation also revealed that the coverage of BCG and Measles vaccines has been far lower. The lowest coverage for BCG vaccine was 15% in Cuddalore HUD and the highest was 75% Madurai HUD. As for the measles, the lowest coverage of 10% was observed in Trichy HUD while the highest again was 44% in Madurai district. The coverage under full immunisation (ie. 3 doses of OPV and DPT + BCG), the achievement was poor. Madurai leads the list with 35% full immunisation with very poor performance in most districts including 4% in Dharmapuri HUD and 3% in Cuddalore HUD.

3.61 A recent survey (May 1989) conducted by National Institute of Health and Family Welfare, New Delhi on All India basis, where the immunisation coverage in urban Madras and rural areas of Cuddalore and Coimbatore have been surveyed, indicates that while the immunisation coverage in these areas has increased significantly in recent years, the coverage under full immunisation still remains low at 25-45%. The coverage of measles vaccine has improved and now ranges between 39-52%. The drop out rates between 1st and 3rd dose of DPT and Polio remain high (10-24%). The important reasons for these include:

REASONS	% RESPONDENTS
– Unaware of need for immunisation	36-43
– Lack of time	12-20
– Vaccinator/vaccine not available	8-20
– Child's ill health	6-15
– Wrong ideas about immunisation	7-8

3.62 Some other interesting findings of the evaluation survey include:

- (1) The timing of the immunisation has been as per schedule except in Dharmapuri district where 25% of the children immunised exceeded the prescribed age.
- (2) The overall performance of immunisation has been better in urban clusters due to easier accessibility to PHCs and private practitioners.
- (3) The supply of health cards to mothers has not been satisfactory.

ORGANISATIONAL INFRASTRUCTURE

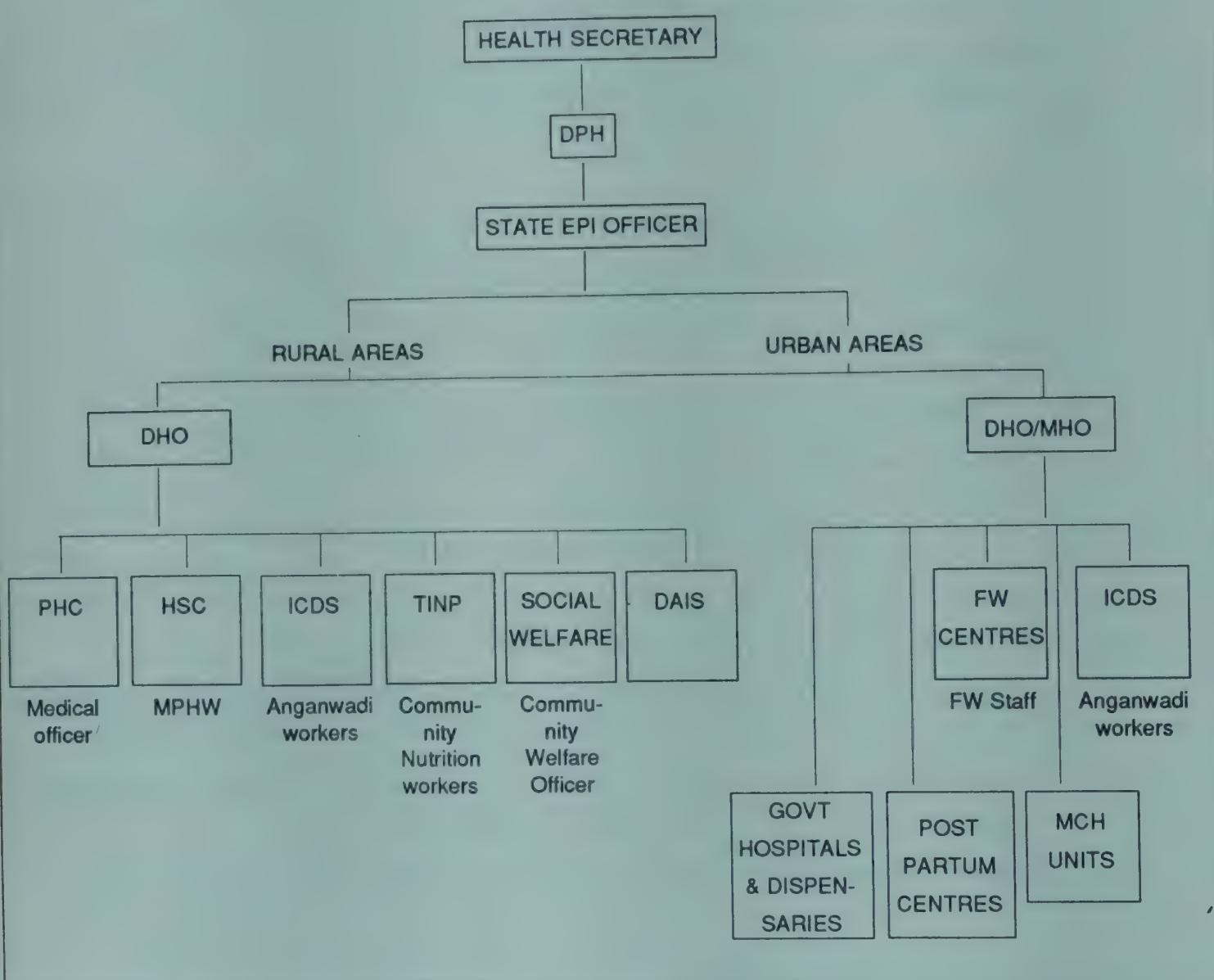
3.63 In order to implement such a massive programme of immunisation the state government has mobilised several grass root level agencies functioning in the areas of health, nutrition, social and child welfare. Besides their individual programme objectives, the achievement

of full immunisation in their project areas is an integral responsibility of these programmes. The efforts of these agencies are co-ordinated at district level by the District Health Office (in urban areas the Municipal Health officer is responsible). At the state level, the adequate emphasis ensured by creating post of a State EPI- Officer (Exhibit 3.15 for the organisation chart for the UIP).

3.64 An effort has also been made to involve voluntary agencies in the immunisation effort. Polio Plus programme is being implemented with the assistance of Rotary International, CMC Vellore and Gandhigram Rural Institute, Madurai who have contributed substantially in this area.

**EXHIBIT 3.15
ORGANISATION CHART FOR UIP**

**STATE LEVEL COORDINATION COMMITTEE
UNDER THE CHAIRMANSHIP OF CHIEF SECRETARY**



3.65 In 1988, the Central Government set up the National Technology Mission on Immunisation. In recognition of the fact that in order to achieve the objective of universal immunisation, detailed planning of the production and supply of quality vaccines, proper attention to

safe conveyance of the vaccines in the cold chain upto the point of usage, adoption of the right practices in the administration of vaccines and effective surveillance are crucial. In order to place proper focus on each aspect of this continuous process, the National Technology Mission has set up 4 Mini Missions.

Mini Mission I : procurement, storage and distribution of vaccines

Mini Mission II : administration of vaccines, monitoring and evaluation

Mini Mission III : vaccine research and development

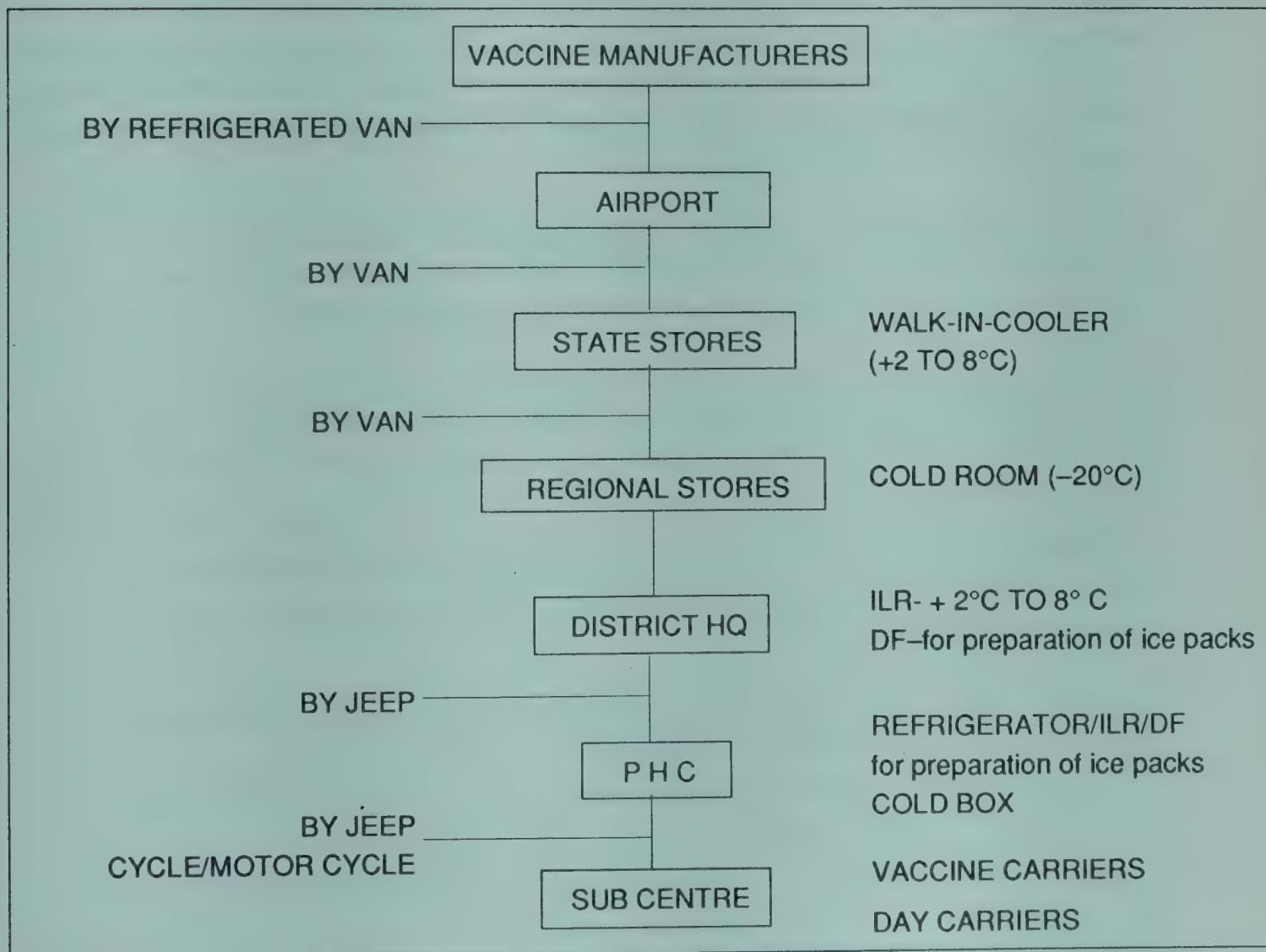
Mini Mission IV : vaccine production.

COLD CHAIN

3.66 Maintaining the cold chain through the process of storage and distribution is important to ensure effectiveness of the vaccine and to ensure success of the immunisation efforts. This is particularly important for highly thermolabile vaccines such as OPV and Measles. In fact, the analysis of potency testing of vaccines done as a part of surveillance programme of DPH revealed that in 1987, close to 50% of the sample vaccines (Polio and Measles) tested were found unsatisfactory. In 1988, this percentage came down to 13%.

EXHIBIT 3.16

COLD CHAIN



3.67 Through the National Technology Mission, a thrust has been provided to maintaining the cold chain (Exhibit 3.16 for the Cold Chain flow chart). The walk-in-coolers have been set up at Madras, Salem, S.Arcot, Thanjavur, Coimbatore, Madurai and Tirunelveli. For monitoring, the cold chain samples are lifted from the State/District and PHC stores every month. Potency tests are carried out at the Kings Institute, Guindy; CMC, Vellore and Pasteur Institute, Coonoor. UNICEF is providing assistance in supply of cold chain equipment and arranging training of cold chain mechanics and users. In the districts of Salem and S.Arcot where the Danish Government funded DANIDA health project is in operation, the cold chain infrastructure is relatively better.

CAUSES OF MORBIDITY AND MORTALITY AMONG CHILDREN

3.68 There are four reliable sources of data on morbidity and mortality among children. These are:

- Civil Registration System
- Hospital Inpatient Data
- Hospital Outpatient Data
- Community Based studies.

Each of these sources have their own advantages and limitations (Box). In the absence of any one appropriate source of data, the morbidity and mortality pattern has been estimated using each of these sources of data (Tables 3.9 to 3.12). Civil Registration and Hospital inpatient data give the mortality estimates while the hospital outpatient and community data give the morbidity profile. Hospital Inpatient data regarding admissions provides the morbidity pattern for severe illnesses.

Civil Registration System: Records deaths and medically certified causes of death. Very often it is an under estimation. Even in Madras metropolis, many deaths go unreported and only 50% of deaths are medically certified.

Hospital Inpatient data: Though this data is generally accurate and reliable it reflects only severe illnesses. Further, it is not truly representative of morbidity and mortality prevalent in the community due to limited access to medical facilities, specially of the rural poor.

Hospital Out patient data: The out patient data reflects medium to severe illnesses and gives a good picture of morbidity. However, very few hospitals analyse their outpatient data.

Community Data: A community based survey gives a true picture of morbidity, specially for common illnesses like diarrhoea, respiratory infections etc. However , to ascertain the morbidity pattern based on the community data, a very large sample size would be required.

TABLE 3.8
CAUSES OF MORTALITY AMONG CHILDREN

CAUSES	% TO TOTAL	
	< 1 YEAR	1-5 YEARS
Peri-natal Causes	69.5	0.0
Diarrhoeal Diseases	3.9	9.9
Vaccine Preventable Diseases	1.5	10.1
Respiratory Problems	3.6	10.4
CNS Problems	1.4	13.5
Malnutrition	0.2	4.5
Cardio Vascular Diseases	1.4	8.3
Congenital Malformation	4.9	0.9
Malignancies	0.0	1.4
Renal Problems	0.1	1.9
Injuries & Poisoning	0.3	6.7
Anaemia	0.2	1.1
Rabies	0.0	0.4
Others	13.0	30.9

Source: Civil Registration System
- Medically certified deaths, Tamil Nadu, 1988

TABLE 3.9
CAUSES OF MORBIDITY AND MORTALITY AMONG CHILDREN

CAUSES	NEW BORN		CHILDREN	
	Admissions	Deaths	Admissions	Deaths
Peri-natal Causes	48	50	—	—
Diarrhoeal Diseases	7	6	15	28
Vaccine Preventable Diseases	1	2	5	8
Respiratory Problems	10	9	19	10
CNS Problems	1	2	8	12
Malnutrition	—	—	10	8
Cardio Vascular Diseases (incl. Congenital malformation)	13	18	3	7
Malignancies	—	—	—	—
Renal Problems	0.4	0.3	4	2
Injuries and Poisoning	1.0	Neg	4	2
Septicaemia	12	10	2	6
Anaemia	—	—	3	2
Rabies	—	—	—	—
Others	7	2	28	16

Source: Hospital Inpatient Data - Institute of Child Health, Madras.

TABLE 3.10
CAUSES OF MORBIDITY AMONG CHILDREN

CAUSE	% TO TOTAL CASES
Peri-natal Causes	-
Diarrhoeal Diseases	16
Vaccine Preventable Diseases	1
Respiratory Problems	52
CNS Problems	5
Malnutrition	17
Cardio Vascular Diseases	1
Renal Problems	1
Injuries & Poisoning	1
Other causes	6
Total no. of cases	6730

Source: Outpatient Data RSRM Hospital, Madras

TABLE 3.11
CAUSES OF MORBIDITY AMONG CHILDREN (0-5 YEARS)

CAUSE	% TO TOTAL CASES
Peri-natal Causes	-
Diarrhoeal Diseases	18
Vaccine Preventable Diseases	1
Respiratory Problems	44
CNS Problems	-
Malnutrition	17
Cardio Vascular Diseases	-
Congenital Malformation	-
Renal Problems	-
Injuries & Poisoning	-
Other causes	19
Total no. of cases	1146

Source: ICDS Project IX, Madras-Town

3.69 The analysis of above tables clearly brings out the following features:

- (1) Vaccine preventable, diarrhoea and respiratory problems are the three major causes of mortality among children. These three major diseases together account for 25% of deaths among infants and close to 50% of deaths among the older children.

- (2) Respiratory problems are the major cause of morbidity among children. They account for 50% of referrals at outpatient departments of hospitals and community health centres.
- (3) Diarrhoeal diseases and malnutrition are the other two major causes of morbidity accounting for 35-40% of referral cases.
- (4) Malnutrition continues to account for 6-12% of deaths among children.
- (5) CNS problems, cardio vascular diseases, malignancy and renal problem account for 20% of deaths among children.

Thus, any child health programme should tackle the following four important causes of morbidity and mortality among children:

- Vaccine Preventable Diseases
- Malnutrition
- Diarrhoea
- Acute Respiratory Infections.

It is in recognition of this fact that Government is emphasising on immunisation, supplementary feeding programmes (discussed in detail in Chapter on Nutrition) diarrhoea management and control of acute respiratory infections in recent years.

DIARRHOEA MANAGEMENT PROGRAMME

DIARRHOEA

Incidence of diarrhoea is more common among younger children (0-5 years). In fact a TINP survey revealed that among pre-school children the incidence is much higher in the 2-5 years age group (77% of total cases) when breast feeding is discontinued.

Most of the deaths during diarrhoea are on account of dehydration. Feeding practices are primarily responsible for this. For example:

- (1) Breastfeeding is discontinued during bouts of diarrhoea.
- (2) Children are starved or given some light solids but milk is completely avoided.
- (3) Common belief is that 'THOSHAM' is the cause of diarrhoea and hence no medical help is sought.

3.70 As seen in the earlier sections, diarrhoeal diseases are one of the leading causes of morbidity and mortality among children in the State. In fact, ICDS and TINP baseline surveys indicate that most children below 5 years suffer 2-3 attacks of diarrhoea each year. Such repeated attacks of diarrhoea lead to malnutrition and growth retardation, on account of malabsorption and food restrictions which are commonly practised by the uneducated mothers in the State. Very often mothers restrict the fluid intake during diarrhoea leading to dehydration and deaths, specially among younger children.

3.71 A significant development in recent years has been the discovery that dehydration from acute diarrhoea of all etiologies in all age groups can be safely and effectively treated by the simple methods of oral rehydration using a single fluid, glucose, sodium chloride, sodium bicarbonate and

potassium chloride - in a mixture known as Oral Rehydration Salts (ORS). It was further discovered that home made oral rehydration solutions using commonly available ingredients like water, salt and sugar or kanji, rice water, butter milk and tender coconut water are equally effective.

3.72 To achieve better home management of diarrhoea, the Central Government has introduced an ORT (Oral Rehydration Therapy) Programme which envisages to create awareness in the community on the use of home available fluids (HAF) to prevent dehydration among children suffering from diarrhoea. The scheme has been launched in all districts covered under the Universal Immunisation Programme and uses the same infrastructure.

3.73 In the first phase, the field functionaries (MPHWs, CNWs, Anganwadi Workers etc.) need to be oriented in diagnosis of dehydration cases and preparation and use of HAF or ORS packets distributed by the Government. In the second phase, these field level functionaries need to educate the mothers in better home management of diarrhoea. In Tamil Nadu, both TINP and DANIDA and some of the ICDS projects have been functioning on these lines. They have had some success on changing feeding practices and increasing mothers awareness regarding oral rehydration therapy as evident from the evaluation studies:

- (1) 50% of mothers in the project areas continued to breast feed their children and 65-100% of mothers gave normal diet during bouts of diarrhoea.
- (2) 30-65% of mothers in the project areas were aware of and practising the oral rehydration therapy.

ACUTE RESPIRATORY INFECTION (ARI) CONTROL PROGRAMME

ACUTE RESPIRATORY INFECTIONS

Pneumonia is the most common among ARIs and accounts for 60% of hospital cases and 80% of deaths. Bronchitis and asthma related problems come second accounting for 16% of hospital admission cases. Fatality rate in ARI is close to 2%, however in the long run the susceptibility to infections and chronic illness is high.

3.74 Respiratory infections account for close to 50% of morbidity among children in Tamil Nadu. Even among hospital inpatient cases ARI accounts for 20% of morbidity and close to 10% of deaths. This highlights the magnitude of the problem and stresses the need for vigorous efforts at launching ARI control programmes.

3.75 Currently an ARI intervention programme is being implemented in the State in the districts of Dharmapuri – Ramanathapuram with the assistance of UNICEF. The programme aims at training the district and community level health functionaries in the detection and management of acute respiratory infections. The community level workers (viz. Multi Purpose Health Workers and Community Nutrition Workers) have to identify the problem of ARI among children in the project areas and encourage home care of the infection with/without antibiotics. In case of severe cases needing medical attention, they have to refer them to PHCs.

VACCINE PREVENTABLE DISEASES

Poliomyelitis

3.76 According to the DPH estimate, 10,000 children in the state get paralytic polio every year. No reliable data on incidence of poliomyelitis is available. A special survey conducted by

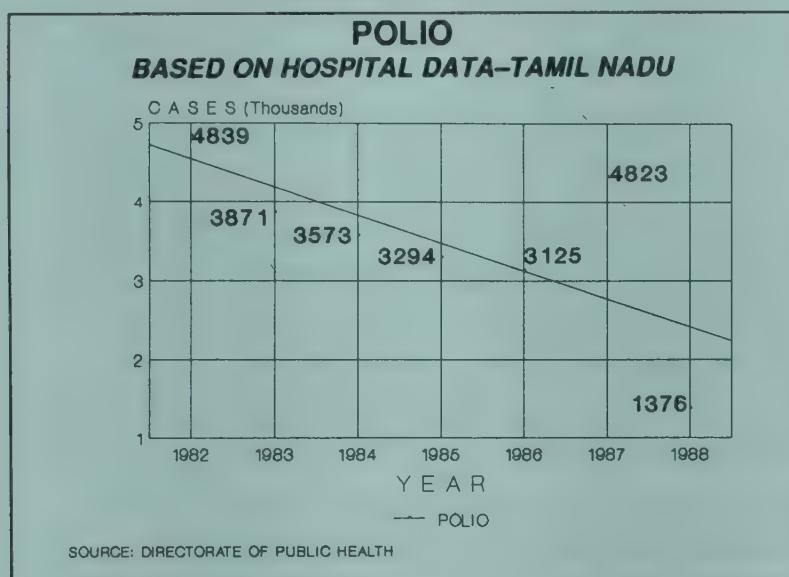
DPH in 1981 which estimated incidence rates for residual paralysis (caused by poliomyelitis) in children indicates that the annual incidence rate is 2.1 per 1000 children (0-5 years) in urban areas and 1.9 per 1000 children (0-5 years) in rural areas.

3.77 Close to 75% cases were for children between 6 months and 2 years. Only 2% of cases reported were for children above 5 years.

- Among affected children, 87% from urban areas and 93% from rural areas had not received oral polio vaccine.
- Only 5% of affected children had complete immunisation.

3.78 The hospital statistics do not provide a reliable estimate of the incidence of polio. However, Exhibit 3.17 which gives case admission data for all Government hospitals in Tamil Nadu indicates a decreasing trend. The case fatality rate in polio is 5-6%, however it frequently results in disability.

EXHIBIT 3.17



TUBERCULOSIS

3.79 Tuberculosis is a major health problem in Tamil Nadu. According to an estimate, close to 10 lakh people suffer from TB of which 25% cases are infectious. This affects children also as many develop a primary complex. According to an estimate by Stanley Medical College, the incidence rate for primary complex is 6.3 per 1000 children (0-14 years). However, only a small percentage of these (close to 5%) would actually manifest the disease.

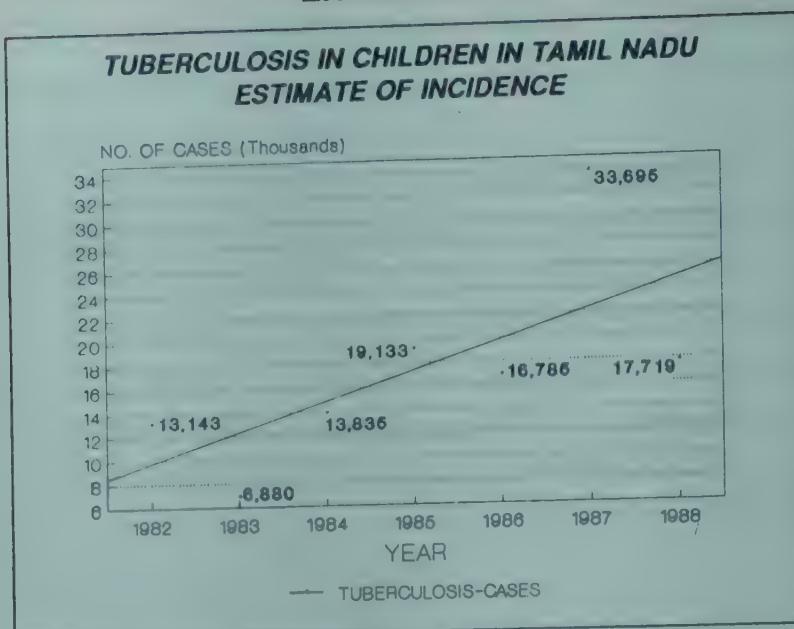
TB IN CHILDREN

TB in children affects their growth and aggravates malnutrition. TB together with conditioning diseases like Measles and Pertussis affects the severity of the disease.

Though TB is curable, in cases affecting meninges and central nervous system (estimated at 25% of TB cases), fatality rate is high. In fact of the total TB deaths reported in hospitals 88% were cases where the central nervous system was affected.

3.80 Central Bureau of Health and Intelligence which monitors TB in the state has estimated the number of TB cases in children at 18,000 in the State. While this may be an underestimate, the major cause of concern is the fact that the data reveal an increasing trend in recent years (Exhibit 3.18). One of the reasons for this could be improved reporting of cases. However, such an increasing trend warrants further investigation into its causes. The case fatality rate in TB is estimated at 16%.

EXHIBIT 3.18



PATHOGENESIS OF TETANUS

Neo-natal tetanus is caused by a potent toxin produced by clostridium tetani spores. These organisms are found in the soil which is rich in organic matter and the gastro-intestinal tracts of domestic animals and human beings. These bacilli are found in heavy concentration in tropical climates (Optimal condition of growth is 35-38°C temperature). The usual site of infection among the infants is the umbilical stump. The toxin of cl.tetani acts directly on central nervous system and causes muscle spasms and seizures. The symptoms appear 2 to 14 days after birth and death follows rapidly. Even in hospitals, the case fatality rate is very high (80% according to the DPH estimate).

However, if the pregnant mother had been administered two doses of tetanus toxoid at least one month apart and at least one month prior to the delivery, the immunity passed on to the new born offers 100% protection against neo-natal tetanus.

of neo-natal tetanus. A study conducted in 1983, estimates that in India close to 0.25 million infants die every year due to neo-natal tetanus. However, there exist significant inter-state variations. In Tamil Nadu the incidence rate for neo-natal tetanus is far lower at 6.1 per 1000 live births in rural areas and nil in urban areas (based on a study conducted by DPH in 1981). In a recent 1989 survey conducted in South Arcot district (rural areas) by the Institute of Health and Family Welfare the incidence rate was even lower at 2.7 per 1000 live births.

3.83 Near universal coverage of the pregnant women under the TT immunisation programme and larger number of institutional births are the primary factors contributing to the low

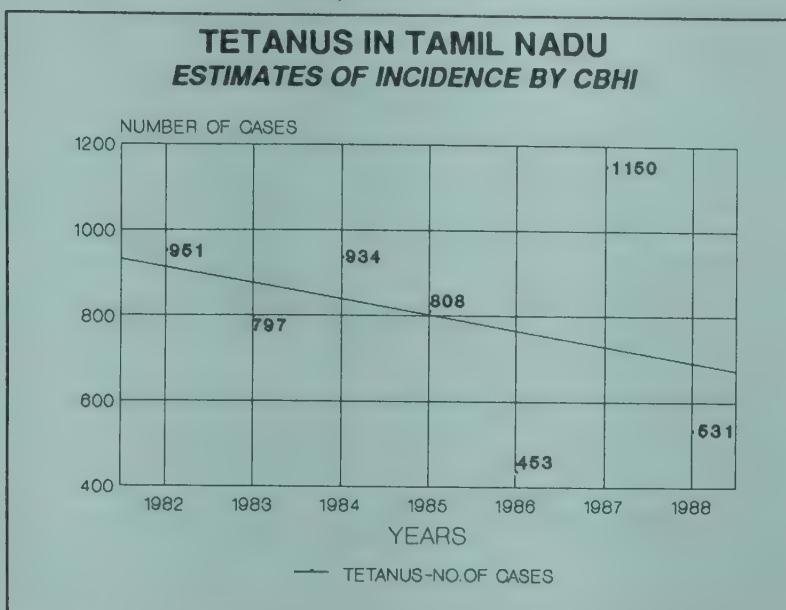
TETANUS

3.81 The pathogenesis of neo-natal tetanus described in the box alongside very clearly indicates various causative agents. The use of unsterilised instruments, for cutting the cord and application of ghee, ash and cowdung are responsible for tetanus in large number of cases. The presence of animals in the house (practice common in many rural areas) also contributes to the high risk of tetanus.

3.82 There is no reliable data available on the incidence

incidence of neo-natal tetanus in the State (Exhibit 3.19). Still the problem persists in some rural pockets and needs to be dealt with on a priority basis.

EXHIBIT 3.19

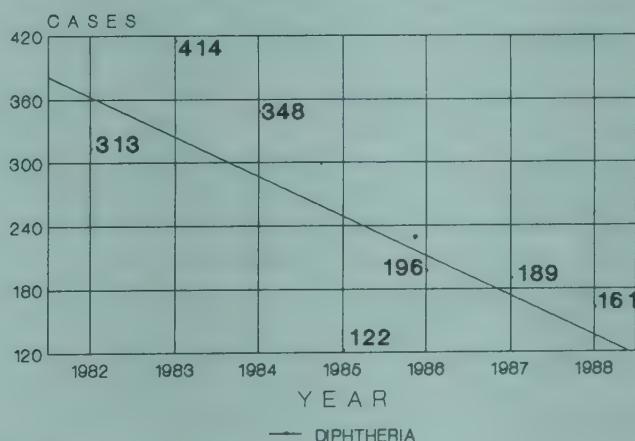


DIPHTHERIA & WHOOPING COUGH

3.84 Diphtheria cases are few in Tamil Nadu and are showing a declining trend. Even at the Institute of Child Health (handling close to 45,400 cases annually) only 1 case of diphtheria and 30 cases of pertussis were reported. DPH statistics based on all hospital data also indicates only 160 cases of diphtheria and 560 cases of pertussis in the State in 1988. In fact, in case of pertussis, the decline in reported cases has been significant since 1982 (Exhibit 3.20).

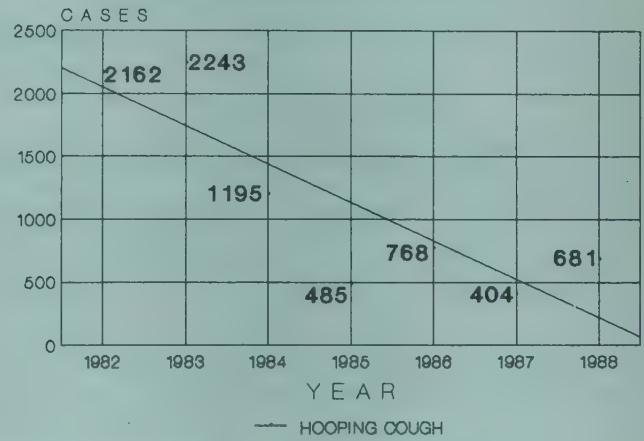
EXHIBIT 3.20

**DIPHTHERIA
ESTIMATES FOR TAMIL NADU**



SOURCE: DIRECTORATE OF PUBLIC HEALTH

**WHOOPING COUGH
BASED ON HOSPITAL DATA**



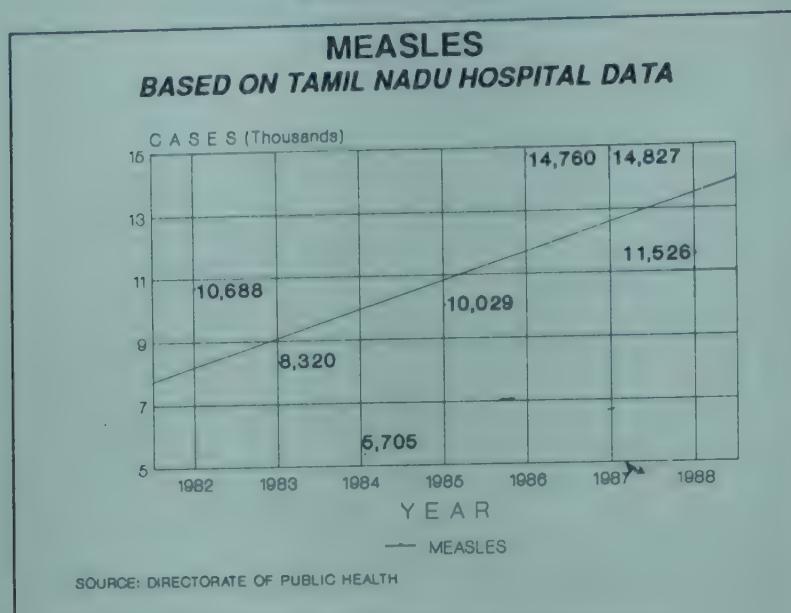
SOURCE: DIRECTORATE OF PUBLIC HEALTH

MEASLES

3.85 In Tamil Nadu there is a wide spread belief that measles is caused by Goddess 'Mari' and is to be treated with neem leaves. If any child is infected with measles, the family does not communicate with the outsiders and the child is not given any medical treatment. Thus, reliable data on incidence of measles is almost impossible to obtain.

3.86 There is some information available based on the hospital statistics which reflect only the serious cases. Exhibit 3.21 indicates that there has been an increasing trend in number of cases admitted to hospitals.

EXHIBIT 3.21



OTHER MAJOR DISEASES

Leprosy

3.87 Tamil Nadu is an endemic State for leprosy in India. There are 4.3 lakh detected cases of leprosy in the state of which 3.5 lakhs have been brought under treatment as of March 1988 at various leprosy control units (363 leprosy control units/centres exist in the State). The prevalence rate is estimated at 19 per 1000, with Salem and S. Arcot topping the list (Table 3.13).

TABLE 3.12
PREVALENCE OF LEPROSY

PREVALENCE PER 1000 POPULATION	DISTRICTS
> 20	Salem, South Arcot
18-20	North Arcot, Kamarajar, Madurai
15-18	Chengalpattu, Periyar
12-15	Pudukottai, Thanjavur
10-12	Tiruchirapalli, Ramanathapuram, Tirunelveli, Dharmapuri
< 10	Coimbatore, Kanniakumari

3.88 Leprosy being so widespread and highly communicable affects children also. Leprosy cases in children less than 3 years are rare as the interval between exposure to infection and the first recognisable symptoms is 2 to 3 years. Prevalence rate is higher among the age group 5-14 years. Leprosy detection has been included as a part of the school health

survey which is done annually by 153 PHCs, 40 Municipalities and select hospitals. These institutions visit schools in the months of July and August and carry out a detailed medical checkup of the children. Based on this survey, the prevalence rate for leprosy is estimated at 7 per 1000. The new case detection rate (NCDR) is 2.5 per 1000 (Table 3.14).

TABLE 3.13
ANNUAL SCHOOL SURVEY ANALYSIS 1981-87

YEAR	EXAMINED	NEW CASES	OLD CASES	TOTAL CASES	NCDR PER 1000	PREVALENCE
1981	25,27,355	12,380	15,916	28,296	4.9	11.2
1982	46,78,890	16,095	28,916	45,011	3.4	9.6
1983	52,09,801	13,369	28,774	42,143	2.6	8.1
1984	57,16,194	14,864	35,560	50,424	2.6	8.8
1985	64,30,990	16,805	33,002	49,807	2.6	7.7
1986	73,50,239	19,111	31,992	51,103	2.6	7.0
1987	72,67,783	17,879	30,875	48,754	2.5	6.7

3.89 Though the coverage of the school health survey is extensive (73 lakh children in 1987) it excludes an important segment of children, ie. the school drop outs. In fact, these children come from the poorest sections of the society and are at a greater risk of contacting leprosy. A State wide survey of such children needs to be conducted to detect leprosy cases among them.

3.90 The Gremaltes Referral Centre for leprosy located at Madras is sponsored by the Federal Republic of Germany. An annual survey is conducted by the Centre in private and corporation schools covering over 85% of the children in the schools. The incidence rate was estimated at 4.1 per 1000 in 1987.

MALARIA

3.91 Malaria in children is diagnosed late as the clinical features evident in adults may or may not appear in children. A study by a team of medical officers in Minjur Block (1985) on prevalence of the malaria parasite, revealed that more than 40% of the cases diagnosed were children under 15 years.

3.92 There were 74,303 cases of malaria reported in 1988 in Tamil Nadu. Percentage distribution of reported cases of malaria was as under:

Percentage

Madras city	46.3
Ramanathapuram	21.8
Periyar	10.5
Salem	3.8
Others	17.61
	100.0

This indicates that the incidence of malaria is high in urban, riverine and coastal rural areas. The other districts with high incidence of malaria include Tiruchirapalli, Madurai, Anna, North Arcot, Dharmapuri, South Arcot and Pudukkottai. National Malaria Eradication Programme (NMEP) is under implementation in the State since 1977. Case surveillance is also being carried out under this programme.

JAPANESE ENCEPHALITIS

3.93 186 Villages in Tamil Nadu, a larger number of them from South Arcot and Tiruchirapalli are affected by Japanese encephalitis. CMC Vellore has studied the incidence of disease in North Arcot District in 1987. Some of their findings are:

- (1) The average incidence of Japanese encephalitis is 1.73 cases per 100,00 population.
- (2) The disease predominantly occurs in infants and pre-school children (70%)
- (3) About 20% die and another one third have some neurological residual effect.

3.94 In 1988, 247 cases were reported in the State of which 50% proved fatal. The infection is due to the virus picked up by mosquitoes from birds, animals and mainly pigs. There is no specific treatment or known pattern of incidence. The Government is carrying out spraying operations in the villages where high incidence has been reported.

ORAL HEALTH STATUS OF CHILDREN

3.95 No data is available on the oral health status of children in Tamil Nadu. Discussions with Madras Dental College reveal:

- Most common dental disease found among children is dental caries and its complications.
- Incidence of dental caries is more in primary teeth than in permanent teeth.
- Rural children have more of dental caries as over 90% of them use ash, brick powder, charcoal etc. for cleaning teeth.
- Delayed eruption of teeth, irregularity of teeth, retained primary teeth etc. are found in children in small numbers, in those who have endocrine disturbances.
- Only a small percentage of urban children use brush and paste.
- Peridental disease, Gingivitis, Vincent infection etc. are other forms of diseases found in children. Of these Vincent infection, a form of Gingivitis is found in children with protein energy malnutrition.

FLUOROSIS

Excess fluorine in water and food causes discolouration of teeth. Fluorine in water can either be due to rocky structure of earth or due to pollution. The content of fluorine varies from 0.4 to 7.5 ppm in different areas in the State. Children who consume more than 1 ppm of fluorine in water developed fluorosis of teeth, resulting in brown permanent discolouration with pitted and corroded appearance.

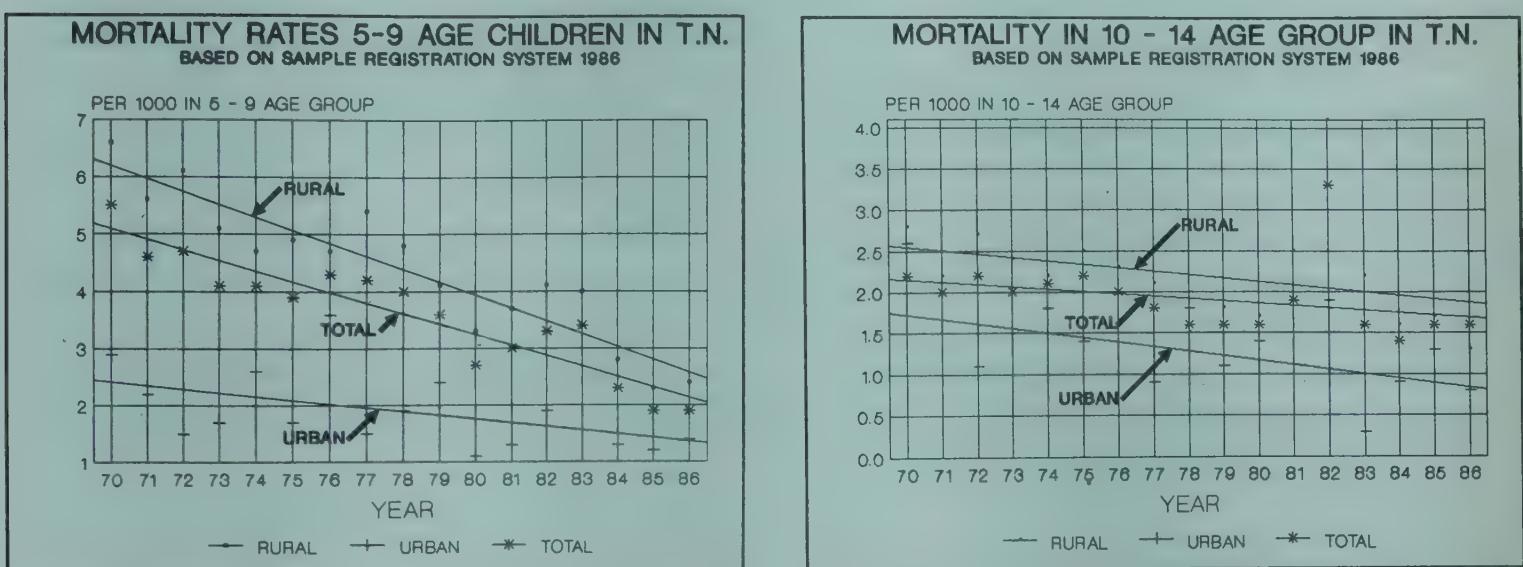
3.96 Dental fluorosis is more prevalent in Dharmapuri and Salem districts and pockets of Coimbatore, Periyar, Kanyakumari, Madurai and Anna districts. Manifestation of fluorosis in primary teeth is normally not found.

MORTALITY OF CHILDREN IN 5-14 AGE GROUP

3.97 Between 1970 to 1986, the death rate in Tamil Nadu in the age group of 5-9 and

10-14 years has come down significantly (Exhibit 3.22). Rural death rates in these groups have come down more significantly. Urban death rate is coming down at a slower rate. This is possibly because of the increase in slum areas with poor sanitation and living conditions.

EXHIBIT 3.22



SCHOOL HEALTH PROGRAMME

3.98 In order to prevent morbidity and mortality among school children the Government of Tamil Nadu introduced the Special School Health Programme in 1961. Currently, the programme is being implemented in 153 selected primary health centres and 40 selected municipalities in the state. It is proposed to extend the programme to all PHCs and Municipalities in the State.

3.99 In PHCs, the medical checkup and health appraisal is being done for the children in the age group 6-11 years and the needy children are supplied with drugs. Cases which require special attention are referred to the District/Taluk hospitals. In the urban area a similar task is done by the Medical Officer and the Health Visitors under the guidance of Municipal Health Officer.

3.100 A cumulative health record is being maintained for each pupil. The programme covers 6.2 lakh children in the State, of which close to 52% are in rural areas.

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

4. Nutrition

4.1 Nutrition is one of the key determinants of growth in infancy and childhood. Good nutrition plays an important role in the full exploitation of genetic potential for physical and intellectual capacities in man. Inadequate nutrition and related illnesses affect the growth, learning ability and health of a child. In the long run, the compounded effects of childhood disabilities affect the physical well being and earning capacities of adults and consequently the national development. Thus, nutrition plays a key role in child survival and development.

4.2 Nutritionally vulnerable segments include pregnant and nursing mothers who play an important role in determining the well being of the child. The high incidence of low birth weight and high peri-natal mortality (still births plus deaths within 0-7 days of birth) can be directly attributed to prevalence of maternal malnutrition and consequent morbidity. Adequate growth during early infancy also depends on the mothers' nutritional status and successful lactation.

CAUSES OF MALNUTRITION

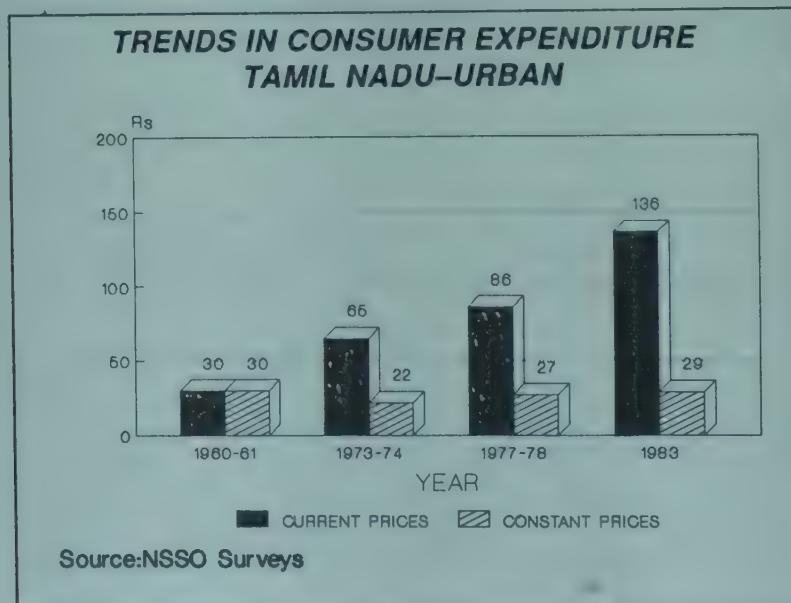
4.3 Malnutrition is a complex problem as it is a result of a number of factors which include:

- (1) low per capita income and consequently poor purchasing power;
- (2) poor availability of foodgrains and other food products;
- (3) lack of education and knowledge about nutrition;
- (4) traditional beliefs, food habits and prejudices and;
- (5) frequent infections and infestations. .

LOW PER CAPITA INCOME AND EXPENDITURE ON FOOD

4.4 The 38th round of the National Sample Survey (NSS) conducted in 1983, estimates the average per capita monthly expenditure in the State at Rs.103 in rural areas and Rs. 136 in urban areas. Though a high proportion of this is spent on food, estimated at 70 and 68 per cent, for rural and urban areas respectively, in absolute terms the expenditure on food

EXHIBIT 4.1



remains very low at Rs. 2.5 to 3.0 per day. This is barely adequate to buy one kilogram of rice or quarter kilogram of pulses or half a kilogram of vegetables/milk, given the prevailing prices of these items in the State.

4.5 Further, Exhibits 4.1 and 4.2 which provide the trends in consumer expenditure for urban and rural Tamil Nadu respectively, indicate that during 1960-61 to 1983 period, though the per capita consumer expenditure increased in current price terms, in real terms it actually declined. A substantial decline in the consumption of foodgrains (Exhibit 4.3) can be seen which account for 30-40 per cent of the expenditure on food. This is an alarming trend given the fact that more than 80 per cent of calories in a normal Indian diet are derived from this food group.

EXHIBIT 4.2

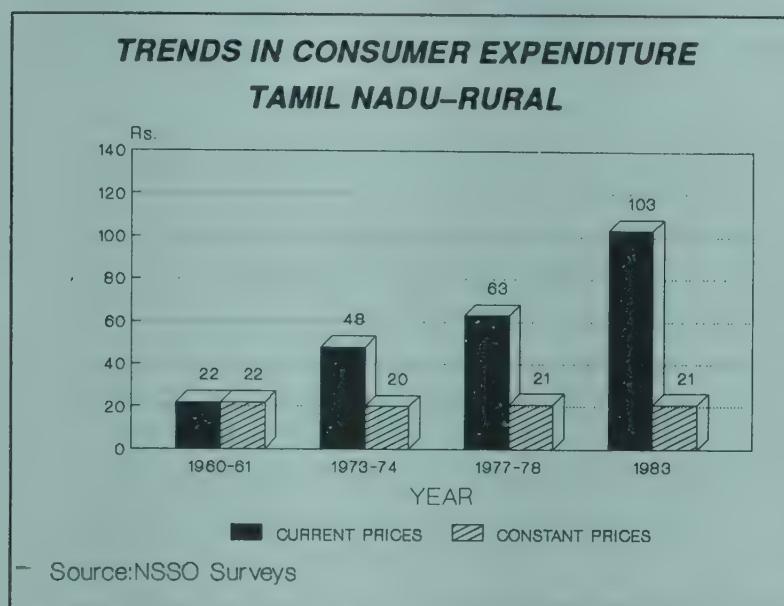
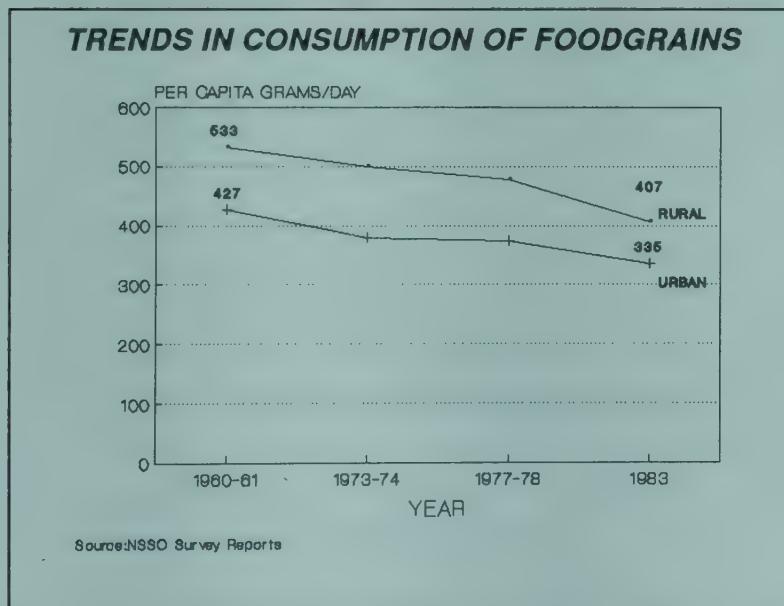


EXHIBIT 4.3



4.6 The major factor contributing to low consumption expenditure is the low per capita income in the State which stood at Rs. 1653 per annum in 1983. During 1960-61 to 1982-83 period the per capita income in Tamil Nadu grew at 7.5% per annum against the national average of 8.9% per annum. The growth of 7.5% per annum, in current price terms translates to 0.5% per annum in real terms due to inflationary conditions in the economy. This poor

performance on the economic front appears to be one of the reasons for the lower consumption of food.

4.7 There is some indication towards higher growth in real per capita income in the State since 1982-83. Based on tentative estimates for Net State Domestic Product (NSDP) the growth rate in real terms works out to 6.2% per annum during the period 1982-83 to 1986-87. This is a positive trend but its impact on the food consumption in the State is not clear as NSS data for recent years is not available.

POVERTY LINE

The poverty line is defined as the income level below which a person cannot meet his daily minimum calorie requirement of 2400K Cal in rural areas and 2100K Cal in urban areas.

INCOME DISPARITIES AND NUTRITIONAL POVERTY

4.8 Unequal distribution of income further aggravates the nutritional status of the population. It is estimated that more than 44% of the rural population and 31% of urban population in Tamil Nadu live below the poverty line.

low the poverty line. Thus, more than 20 million people in the State are unable to meet their basic calorie requirements. However, this represents a considerable improvement over 1972-73 when the 27th round of National Sample Survey estimated that 60% of population in the State were living below the poverty line.

THE PUBLIC DISTRIBUTION SYSTEM

4.9 In a country like India where there are wide disparities in income and the purchasing power of the population, it is only through the public distribution system (PDS) that the minimum food requirements of the low income consumers can be met by supplying food products at prices below the open market rate. The PDS is well developed in Tamil Nadu. There are over 21,000 distribution outlets (Fair Price shops) in the State of which over 17000 (85%) are in rural areas and the balance in urban areas. There are 118 lakh family card holders in the State. Rice, sugar, kerosene and edible oils are the major items which are extensively distributed through PDS.

PUBLIC DISTRIBUTION SYSTEM IN TAMIL NADU

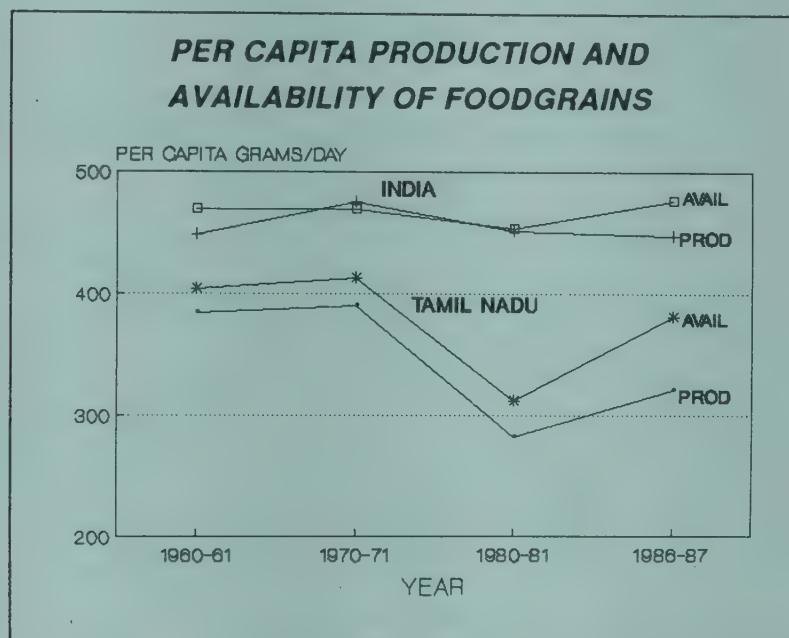
ITEM	ENTITLEMENT per family card/month	PRICE (1989) (Rs./kg)
Rice	20 kg or 4 kg/adult 2 kg/children	2.50
Wheat	10-15 kg	Wheat 2.50 Maida/Rava 4.50
Sugar	450 gms/member	5.25
Edible oil	2 kg	17.30
Kerosene	Corporation/ District HQ -10 litres Municipal towns 6 " Town Panchayat 3 " Village Panchayat 2 "	2.30/ litre

The PDS prices usually range between 40-60 per cent of open market prices. The distribution coverage however, remains inadequate. Even in the case of a widely distributed commodity like rice, the family entitlement under the PDS system is only 35 per cent of the requirement. This super imposed over the fact that the PDS is able to cover only 50% of its targeted distribution leads to the conclusion that the PDS has a share of less than 20% in the total consumption of rice in the State. However, this is a substantial improvement over 1980-81 when PDS accounted for less than 5 per cent of total consumption in the State. Further, PDS had led to shift in consumption from coarse cereals to rice and jaggery to sugar. This trend has an adverse effect on nutrition.

TRENDS IN FOOD PRODUCTION AND AVAILABILITY

4.10 Though the production of foodgrains increased during 1960-61 to 1986-87 period (average rate of 1.2% pa), it failed to keep pace with the population growth, leading to a decline in per capita net production and consequently its availability (Exhibit 4.4) in the State. Against this, at the All India level the trend has been positive and average per capita net availability has marginally increased. Per capita availability in the State now represents only 80% of the national average.

EXHIBIT 4.4



4.11 The trends in production and availability of other food products show a mixed pattern. While the per capita availability of milk and eggs in the State has increased significantly, that of pulses (an important source of proteins in Indian diets), meat and fish has remained more or less stagnant (Exhibits 4.5 and 4.6). Further, for all the food products per capita availability remains far below the intake recommended by the Nutrition Advisory Committee of the Indian Council of Medical Research.

4.12 The major factor responsible for decline in per capita availability of pulses, is the production which has remained more or less stagnant at the 1960-61 level (even at All India level). This has led to a substantial decline in per capita availability (especially at All India level—from 69 gms to 36gms) and has pushed up the prices of pulses to 3-4 times of that of the earlier level. Pulses are therefore beyond the reach of the common man.

EXHIBIT 4.5

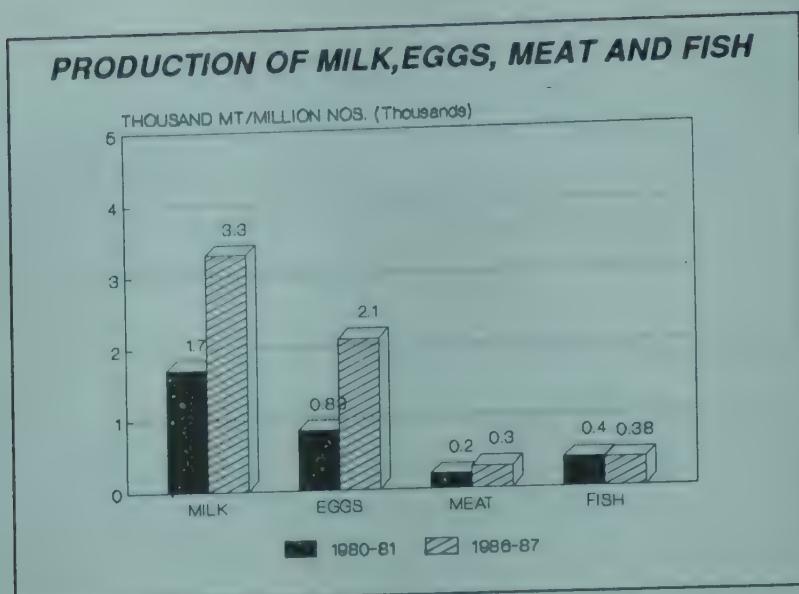
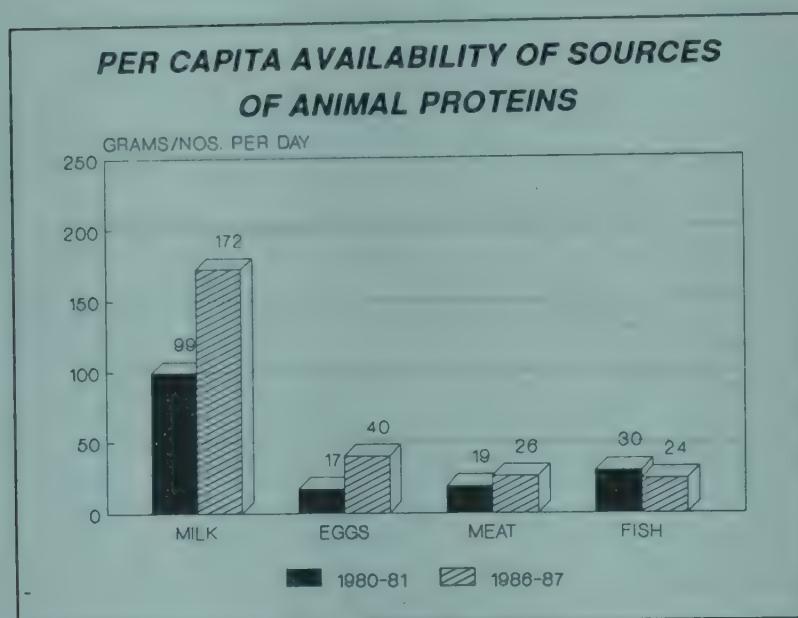
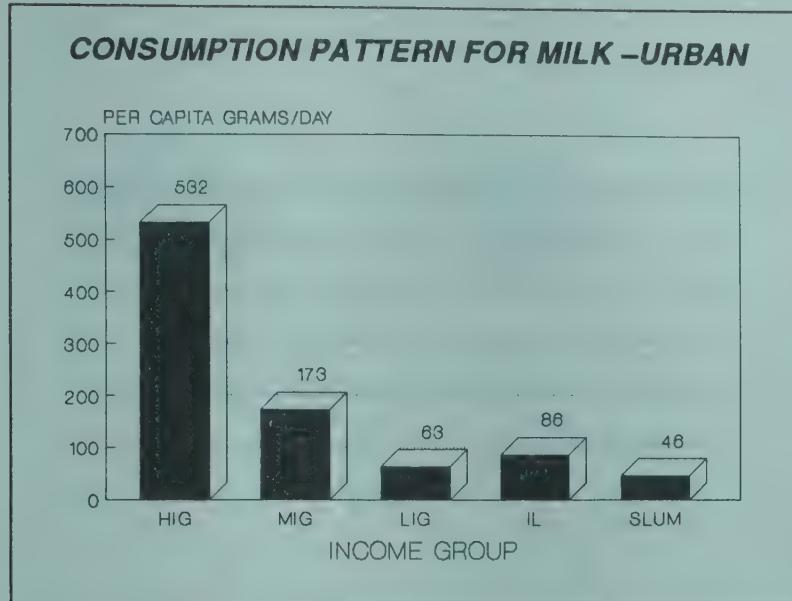


EXHIBIT 4.6



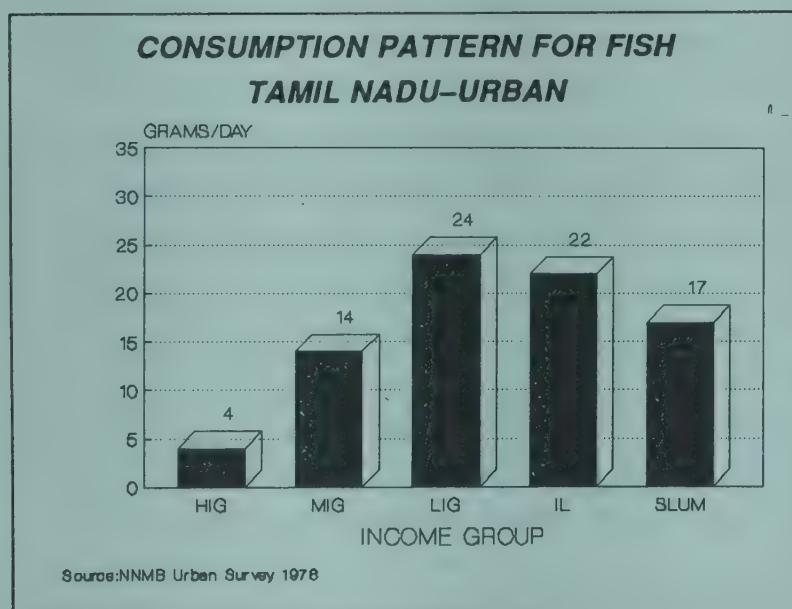
4.13 The production and consequently the availability of milk in the State has increased substantially since 1980-81, due to successful cooperativisation of production and distribution under 'Operation Flood' Programme in the State. However, the consumption pattern for milk in the State is highly skewed with higher income groups and the urban population accounting for the bulk of the consumption. According to a study done by Madras Institute of Development Studies (MIDS), 60% of milk consumption in the State is in the urban areas. National Nutrition Monitoring Bureau (NNMB) urban data for the year 1979 indicates that vis-a-vis the average per capita consumption of 530 gms/day of milk in the upper income groups, the consumption among slum dwellers is only 46gms/day (Exhibit 4.7).

EXHIBIT 4.7



4.14 The stagnant production of fish since 1980-81 and the consequent decline in per capita availability have affected poor communities the most as it is an important source of protein in low income groups who cannot afford other sources of animal proteins due to high prices. The NNMB urban survey corroborates this, as per capita daily intake of fish is 17-24gms in lower income groups as compared to 14gms for middle income groups and 4gms for upper income groups (Exhibit 4.8).

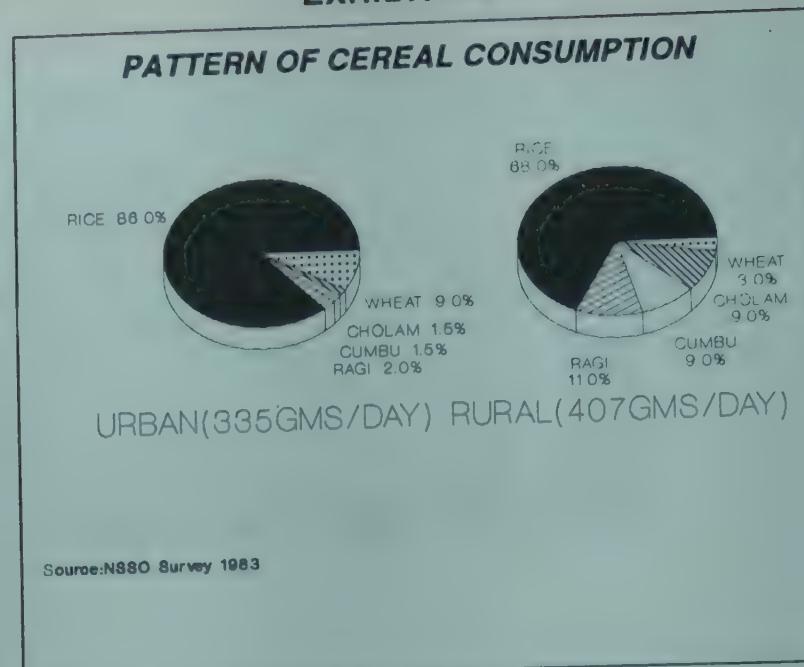
EXHIBIT 4.8



DIETARY HABITS AND ITS IMPACT ON NUTRITION

4.15 The diet in the State is predominantly cereal based and rice accounts for more than 68% of total cereal consumption in the rural areas. Coarse cereals like ragi, cumbu (bajra) and cholam (Jowar) are also consumed in the rural areas. In the urban areas, there is a definite preference for rice over coarse cereals with rice accounting for 86% of total cereal consumption. There is also a trend towards an increase in wheat consumption which now contributes 9% of total urban cereal consumption (Exhibit 4.9).

EXHIBIT 4.9



TYPICAL DIET IN THE STATE

A typical dietary pattern for the day in rural areas includes morning "tiffin" which consists of canji or left over rice. Lunch consists of rice and butter milk with chillies and pickles. The meal for the day is cooked at night which consists of either rice with sambar or rasam or canji/koozhu made from locally available millets. Vegetables are consumed only twice or thrice a week and in very small quantities. Milk is consumed in small quantities for tea/coffee and meats and fruits are consumed only on special occasions. Fish both fresh and dried is consumed in the coastal areas.

In the urban areas, among the poorer households morning breakfast consists of either left over rice or preparations like idli which are very often bought from outside. Lunch consists of rice and butter milk with pickles. Again dinner is the only meal cooked and consists of rice, sambar and some vegetables. In more affluent households curd or milk preparation and fruits like banana, jack fruit, guava, and mangoes are consumed in season. Meat is consumed only on special occasions due to its high cost. More recently there is a greater awareness of wheat based products and their consumption is on an increase in the urban areas.

SURVEY OF DIETARY INTAKE IN THE STATE

4.16 The National Nutrition Monitoring Bureau (NNMB) which collects data on dietary intake in the State corroborates some of the above observations. Table 4.1 which gives the diet composition in the urban and rural areas in the State and compares it with All India average indicates that the food intake in both urban and rural Tamil Nadu is lower than the national average and inadequate in comparison with levels recommended by ICMR. Dietary intake of urban slum dwellers is no better than that of the rural population both at national and State levels. In fact, consumption of cereals is far lower among urban slum dwellers with

no corresponding increase in the intake of other food items. The consumption of milk, vegetables and fruits in the State is also fairly low, both compared to All India average and the KMR recommended intake. Further, as mentioned earlier, the consumption of milk and fruits is largely restricted to urban areas. In fact the variety of food intake is extremely limited in rural areas.

TABLE 4.1
AVERAGE DAILY INTAKE OF FOODS

(in gms)

SL. NO.	FOOD ITEM	RURAL		URBAN		RECOM- MENDED
		TN	ALL INDIA	TN	ALL INDIA	
1.	Cereals and Millets	479	498	396	422	460
2.	Pulses	26	30	29	38	40
3.	Leafy vegetables	7	23	13	14	40
4.	Other vegetables	56	53	38	48	60
5.	Roots and Tubers	17	47	42	68	50
6.	Nuts and Oilseeds	4	12	6	11	-
7.	Condiments and Spices	15	11	22	14	-
8.	Fruits	20	21	30	30	50
9.	Flesh foods (incl. Fish)	7	15	30	19	20
10.	Milk	34	78	55	69	150
11.	Fats and Oils	6	10	14	18	40
12.	Sugar and Jaggery	12	21	17	24	30

Source: NNMB Report for the Year 1982 and 1984 urban report

Note: (1) The recommended intake is for an adult male sedentary worker.

(2) Urban data is for Lower Income Groups (LIG) and Slum population which according to an estimate account for more than 60 per cent of the population in urban areas.

NNMB SURVEY METHODOLOGY

The NNMB survey covers 4 of the 20 districts in the State every year and the results are used to extrapolate the average for the State. NNMB rural surveys were carried out from 1976 to 1982. Though there are year to year fluctuations on account of district variations and composition of the sample, the results are indicative of the problem areas that need attention. The urban survey was conducted in Madras city during the period 1975-79. Thus, it is not representative of all urban areas in the State but highlights the problem areas specific to urban agglomerations. In fact, there is a need for State wide survey covering food habits and nutritional status of the population.

4.17 While this diet consisting of a combination of cereals and pulses would be qualitatively adequate for meeting the energy requirement, frequently it is not consumed in adequate quantities leading to calorie deficiency and consequently protein deficiency. While rice supplies very little protein when compared to wheat, the biological value of this protein is very good. However, micro-nutrient deficiencies like Vitamin A and iron are endemic to a rice eating population. Further, low intake of fruits, vegetables and milk results in high prevalence of micro-nutrient deficiencies.

CALORIE AND NUTRIENT COMPOSITION OF DIETS

4.18 Table 4.2 clearly points out that there exists a substantial gap in the intake of calories, proteins and some of the essential micro-nutrients like Vitamin A (Retinol) and Riboflavin (Vitamin B), both in urban and rural areas. This gap in calories at the State level translates into large deficiencies among the lower income groups given the skewness in income distribution. Further, calorie deficiencies (indicative of inadequate food per se) are more pronounced than protein deficiencies thus suggesting that any effort towards bridging the calorie gap would automatically ensure sufficient protein intake. Vitamin A and Riboflavin deficiencies are widely prevalent resulting in high incidence of Xerophthalmia and Angular Stomatitis specially among children.

TABLE 4.2

CALORIE AND NUTRIENT ADEQUACY OF DIETS -1982

	Recommen-ded	Rural		Urban	
		Actual	Actual as % of recommended	Actual	Actual as % Recommended
Calories (K Cal)	2400	1964	82	1879	78
Proteins (gms)	55	50	91	47.3	86
Calcium (mg)	500	510	102	444	89
Iron (mg)	24	27.3	114	21.6	90
Vitamin A -Retinol	750	190	25	292	39
Vitamin B - Thiamine (mg)	1.20	1.13	94	0.65	54
- Riboflavin (mg)	140	0.72	51	0.59	42
- Nicotinic Acid (mg)	16.0	11.8	74	11.1	69
Vitamin C (mg)	40	30	75	37	93

Note: (1) Urban data represents an average for LIG and slum dwellers which constitute 60% of urban population.

4.19 The Table also brings to notice the fact that the dietary intake of slum dwellers in urban areas is far lower than that of the bulk of the rural population. In the rural areas the intake of calcium, iron, thiamine and riboflavin is higher than that in the urban areas. This is probably due to higher consumption of coarse cereals like ragi which is rich in calcium and iron) and cumbu (which is rich in iron) and preference for jaggery (rich in iron) and parboiled rice (which contains riboflavin) vis-a-vis sugar and polished rice and the habit of consuming left over fermented rice (which is rich in thiamine) for breakfast, rather than bought out items like idlis and biscuits. Against this, the intake of Vitamin A and Vitamin C is higher in urban areas, probably due to higher intake of vegetables, fruits and milk.

4.20 Inspite of the apparently adequate intake of iron, nutritional anaemia is widely prevalent in the State specially among pre-school children, pregnant and nursing mothers and women in the child bearing age. This is possibly due to the poor absorption of iron from the predominantly cereal based diets (due to presence of oxylates and phthalates) coupled with protein and Vitamin A deficiencies and worm infestations.

CUSTOMS, BELIEFS AND PREJUDICES

4.21 Customs, beliefs and prejudices affect the dietary habit and in turn the nutritional status of the population. In fact, many age-old customs and practices are perpetuated in the State due to lack of knowledge and ignorance. Some of the widely prevalent customs and beliefs which are detrimental to the nutrition of the child and the mother include avoiding papaya (rich in Vitamin A) during pregnancy as it is believed to cause abortions, the practice of discarding colostrum and giving prelacteal feeds to the new borns which leads to high incidence of infections among new borns and the practice of avoiding breast feeding of infants during diarrhoea which aggravates diarrhoea and leads to dehydration and deaths. Further, there is a widespread belief that banana and orange cause phlegm and that foods like mango, papaya and egg are "hot" and curd and juices are "cold" and are to be avoided during certain seasons and illnesses. These beliefs and food fads do a lot of harm by depriving the child and mother of some of the most nutritious foods.

FREQUENT INFESTATIONS AND INFECTIONS

4.22 According to a recent survey of 640 pre-school children (age group 6-60 months) in Tamil Nadu, conducted by the Directorate of Public Health (DPH), more than 60 per cent of children were found infested with worms, the majority with round worms. Worm infestation affects the absorption of nutrients specially iron and aggravates the problem of malnutrition and anaemia in children. Further, the poor quality of the environment coupled with malnutrition heightens susceptibility to infectious diseases. It has been observed that the repeated bouts of infections, particularly diarrhoea and upper respiratory infections, contribute significantly to malnutrition. During upper respiratory infections (including measles, TB and whooping cough) the urinary loss of Vitamin B2 (riboflavin) is markedly increased and this perpetuates the state of deficiency. In fact measles attacks are frequently followed by severe Vitamin A deficiency and protein energy malnutrition. Infections also lead to protein breakdown and negative nitrogen balance. Thus a vicious circle of malnutrition and poor health perpetuates.

CALORIE AND NUTRIENT INTAKE OF CHILDREN AND PREGNANT AND NURSING MOTHERS

4.23 The earlier sections discuss the availability of food and the calorie and nutrient intake in the State at the household level. The effect of inadequate intake at the household level, on the diets of children was assessed during the NNMB rural survey for the year 1978. The survey results indicate that the nutritional status of children, pregnant women and nursing mothers is worse than the other sections of the population.

4.24 Lack of knowledge about nutritional requirement of children and pregnant and nursing mothers is primarily responsible for poor nutritional status of these groups. A study of energy adequacy among pre-school children in relation to adults, conducted by Brahman et al (Table 4.3) indicates that in as many as 25 per cent of the families, the energy intake of 'only' the pre-school child was deficient while both the parents had adequate intake.

TABLE 4.3

ENERGY STATUS OF PRE-SCHOOL CHILDREN IN RELATION TO ADULTS - ALL INDIA

FAMILY CLASSIFICATION	PERCENTAGE
1. Intake of all i.e., adult male/female and the pre-school child is adequate	31.1
2. Intake of adults is adequate while the child's is inadequate	25.4
3. Intake of all is inadequate	19.1
4. Others	24.4
Total	100.0

Source: NNMB

This indicates disproportionate intra-familial distribution of food arising from lack of knowledge about the nutritional needs of children. Even among pregnant and nursing mothers, it is the lack of knowledge (of course in addition to poverty) which affects the food intake and nutritional status. In a study conducted by Avinashilingam Home Science College, Coimbatore, more than 50 per cent of pregnant and nursing mothers thought their normal diet was adequate during these special times. They were completely unaware about the need for desirable weight gain during pregnancy, advantages of breast feeding, nutritional requirements for successful lactation etc. (Table 4.4).

TABLE 4.4
**KNOWLEDGE AND AWARENESS AMONG PREGNANT AND
 NURSING MOTHERS**

KNOWLEDGE/AWARENESS	% RESPONDENTS
1. Pregnant mothers who considered usual diet to be adequate	63%
2. Nursing mothers who considered usual diet to be adequate	40%
3. Pregnant mothers who were not aware about desirable weight gain during pregnancy	99%
4. Nursing mothers who initiated breast feeding on:	
Day 1	30%
Day 2	30%
Day 3	26%
5. Mothers who were not aware about minimum weight at birth to ensure foetal viability	83%

Source: Report on the pre-evaluation survey (1987) of the Targeted Maternal and Child Health Education Project sponsored by USAID through Child Relief Services.

4.25 Exhibits 4.10 and 4.11 provide a pictorial representation of the percentage deficiency of calories and nutrients in the diets of these groups. The exhibits show that:

- (1) The calorie deficiency is high at 30-40% in the children of all age groups. Further it is higher than the calorie deficiency of 20% at the household level.
- (2) Protein inadequacy is more common in the children in the adolescent age group (13-16 years) as accelerated growth at this age makes additional demands on nutrients.
- (3) Vitamin A deficiency is widely prevalent affecting children in all age groups and pregnant and nursing mothers. Vitamin A deficiency and consequently the incidence of Bitots spots increases with age as the dietary intake does not increase proportionate to requirements. However, corneal involvement leading to blindness is more common among pre-school children.

EXHIBIT 4.10

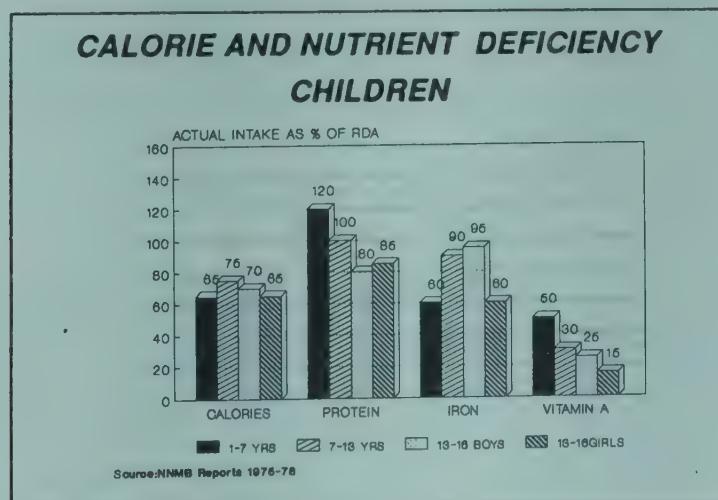
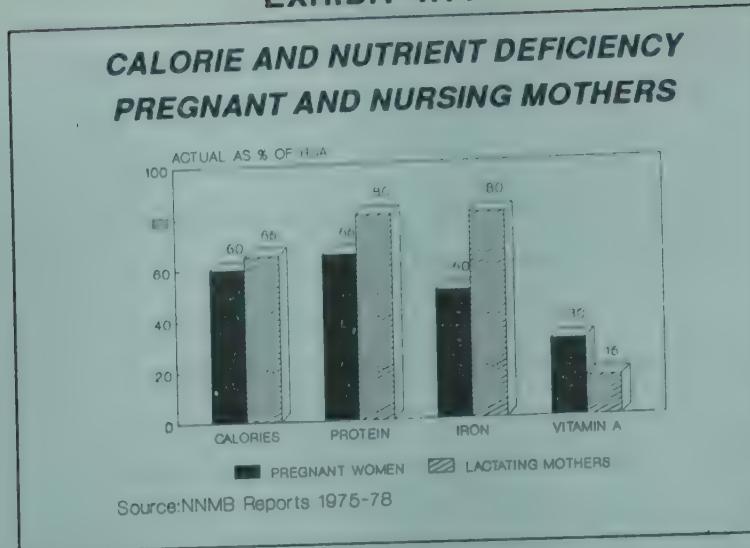


EXHIBIT 4.11



- (4) Iron deficiency is commonly observed among pre-school children and girls who have attained the age of menarche.
- (5) Pregnant and nursing mothers suffer from severe inadequacy of calories, as well as Vitamin A deficiencies. The protein & iron intake of pregnant mothers is low at 65 & 50% respectively at a period of crucial need, leading to growth impairment of the foetus, resultant low birth weight (LBW) babies, still births and high peri-natal mortality.

Unfortunately, similar data is not available for the urban areas but the poor nutritional status of low income urban children suggests that the food and nutrient intake are inadequate in the urban areas as well.

CLINICAL SIGNS OF MALNUTRITION

Protein Calorie Malnutrition (PCM)

Kwashiorkor: Usually manifests in the form of oedema over ankles and feet and at times over other extremities, accompanied with growth retardation and muscle wasting. Frequently discolouration of hair, moon face and skin changes are also observed.

Marasmus: Usually manifests in the form of severe growth retardation (usually below 60% of standard weight for age) and wasting of muscles and sub-cutaneous tissues.

Emaciation: Milder degree of PCM, where child is underweight, disproportionate, with long seeming body and thin limbs and has small chest with prominent ribs.

NUTRITIONAL STATUS OF CHILDREN

4.26 Inadequate and improper food intake results in malnutrition which manifests itself in the form of growth retardation, clinical signs of malnutrition or nutritional deficiency disorders. There are a number of ways of measuring malnutrition among children. These include:

- (1) Growth monitoring and assessment;

- (2) classification based on weight for age (Gomez Classification) or linear measurement of height along with body weight (Waterlow grades)
- (3) assessment based on the prevalence of clinical signs of malnutrition; and
- (4) incidence of nutritional deficiency disorders.

4.27 Though recent thinking promotes growth monitoring and evaluation using growth charts as the tool for assessing the nutritional status of children, there are a number of practical difficulties which discourage its use in nutrition surveys. The Gomez Classification based on weight for age criterion has been widely used in the past for assessing the nutritional status of children during these surveys. Exhibits 4.12 and 4.13 provide the nutritional status of pre-school children (1-5 years) in urban and rural Tamil Nadu as assessed by NNMB surveys (1979 and 1982 respectively), using the Gomez classification.

EXHIBIT 4.12

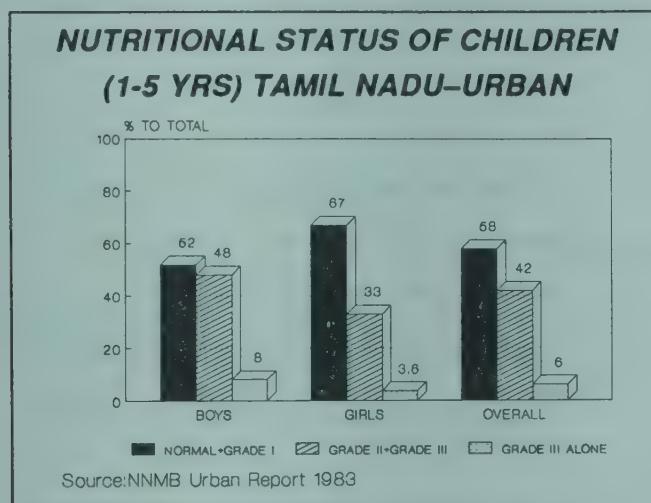
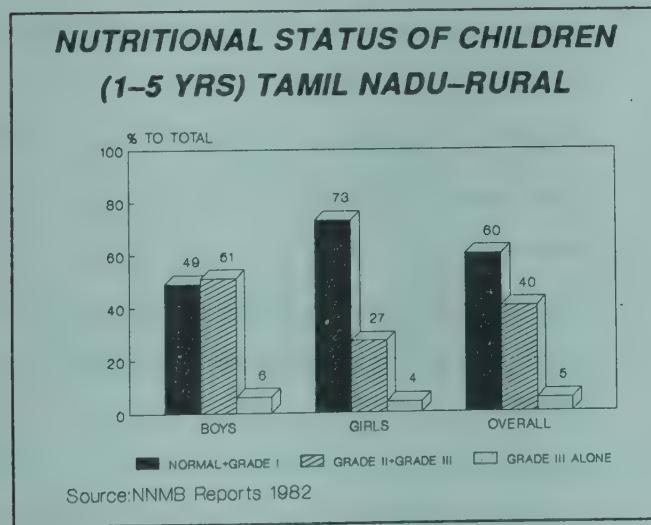


EXHIBIT 4.13



4.28 The above Exhibits indicate that close to 40% of pre-school children in both rural and urban areas suffered from moderate to severe malnutrition. This percentage is higher among the boys (at 48-50%) than the girls (27-33%). The prevalence of severe malnutrition is also high at 5-6%. Nutritional status of urban LIG and slum children is worse than the children in rural areas.

GOMEZ CLASSIFICATION

The Children are classified on a scale of 1 to 4 based on the relation of their bodyweight to the age specific standard set by ICMR.

- (1) Normal >90% of Standard weight
- (2) Mild Malnutrition 75-90% of Standard weight
- (3) Moderate Malnutrition 60-75% of Standard weight
- (4) Severe Malnutrition <60% of Standard weight.

The standard for body weight set by ICMR

Age (Years)	Boys (kg)	Girls (kg)
1+	10.50	9.80
2+	12.50	11.30
3+	14.75	13.30
4+	17.25	15.65

MICRO NUTRIENT DEFICIENCIES

4.29 Aggravating the deficiencies in calorie, protein and energy intake are major deficiencies of micro-nutrients like Vitamin A and B, iron and iodine. The NNMB surveys also assessed the prevalence of clinical signs of malnutrition among children.

Vitamin A deficiency

Night Blindness: Difficulty in seeing clearly at dusk or at night.

Conjunctival Xerosis: Condition characterised by dryness of conjunctiva.

Bitots Spots: Well demarcated white or pale grey triangular plaques appear on the conjunctiva.

Keratomalacia: Bilateral lesions accompanied with soft or perforated cornea leading to blindness.

B.Complex deficiency

Angular stomatitis: Lesions at the angles of the mouth, at times associated with fissuring caused due to deficiency of Riboflavin.

Glossitis: Manifests in the form of red and raw tongue with muucus membrane denuded to varying extent.

Vitamin C deficiency

Scurvy: Manifest in the form of spongy bleeding gums.

Vitamin D deficiency

Rickets: Leads to softening of skull and other bones.

4.30 Tables 4.5 and 4.6 which provide the data on the prevalence of clinical signs among children in various age groups in rural and urban areas respectively indicate that:

- (1) 5% of infants and 2-4% of pre-school children suffer from severe protein energy malnutrition which manifests in the form of Emaciation/Marasmus.
- (2) Prevalence of Xerophthalmia (Vitamin A deficiency) is high at 5-7% in both pre-school and school going children in rural areas and 3-12% in urban areas. This usually manifests in the form of conjunctive xerosis and bitots spots which are both reversible. In fact, in the urban slums prevalence of bitots spots is much higher at 8 and 4 percent among boys and girls respectively vis-a-vis 3 per cent in rural areas.

TABLE 4.5
PREVALENCE OF CLINICAL SIGNS OF MALNUTRITION AMONG
RURAL CHILDREN - 1982

(%)

	IN-FANTS	PRE-SCHOOL	5-12 YRS.		12-21 YRS.		>21 YRS.	
			B	G	B	G	M	F
No. of Children surveyed	130	598	380	337	255	272	481	573
NAD	92	79	71	74	76	83	83	63
PEM								
Kwashiorkor	-	0.3	-	-	-	-	-	-
Emaciation	5.4	3.7	0.3	2.1	-	-	-	-
Marasmus	0.8	-	-	-	-	-	-	-
Vitamin A								
Conj. Xerosis	-	3.0	2.1	0.9	0.8	0.4	-	0.4
Bitots Spots	-	3.8	3.4	2.7	4.7	1.1	0.4	0.5
Other Vit. A	-	0.2	0.6	0.3	-	-	0.2	-
Vitamin B								
Angular Stomatitis	-	7.5	16.8	14.0	10.2	6.7	1.3	2.4
Other Vit. B related	-	-	-	-	-	0.4	-	-
Dental Caries	-	0.5	8.2	7.4	7.4	4.8	8.9	10.6

Source: NNMB Report for the year 1982.

Note: (1) NAD: No Apparent Disorders

TABLE 4.6
PREVALENCE OF CLINICAL SIGNS OF MALNUTRITION AMONG
URBAN CHILDREN - 1979

(%)

	IN-FANTS	PRE-SCHOOL	5-12 YRS.		12-21 YRS.		>21 YRS.	
			B	G	B	G	M	F
No. of Children surveyed	59	202	134	116	141	203	155	241
NAD	91.5	82.2	58.2	65.5	69.5	76.4	85.2	63.1
PEM	-	-	-	-	-	-	-	-
Kwashiorkor	-	-	-	-	-	-	-	-
Emaciation	1.7	-	-	-	-	-	-	-
Marasmus	3.4	2.0	-	-	-	-	-	-
Vitamin A	-	-	-	-	-	-	-	-
Conj. Xerosis	-	-	3.7	0.9	-	1.0	-	-
Bitots Spots	-	2.9	8.2	4.3	6.4	4.9	1.3	1.7
Other Vit. A	-	-	-	-	-	-	-	-
Vitamin B	-	-	-	-	-	-	-	-
Angular Stomatitis	-	9.4	12.7	11.2	14.9	8.4	2.6	5.6
Other Vit. B related	-	1.0	3.7	4.3	6.4	5.9	2.6	4.5
Dental caries	-	3.0	11.9	15.5	5.0	5.8	0.6	5.8

Source: NNMB Urban Report for the year 1984

This may be due to higher detection of these in the urban centres and could point towards higher prevalence than what is detected in the rural areas. The prevalence of Xerophthalmia is more among boys than girls.

- (3) Prevalence of Keratomalacia, Corneal Xerosis - severe forms of Vitamin A deficiency disorders leading to blindness, is relatively low, but significant.
- (4) Angular stomatitis (caused due to deficiency of Riboflavin) is widely prevalent among school going children both in the rural and urban areas. Prevalence rate is estimated at 10-20%.
- (5) Prevalence of scurvy (Vitamin C) and rickets (Vitamin D) is very low and insignificant.
- (6) Dental caries are observed in 7-15% of all higher age group children. Prevalence of dental caries is highest among children in 5-12 years age group, living in urban slums.

NNMB surveys did not collect data on the incidence of iron deficiency anaemia and goitre. However there are some district level studies which have assessed the prevalence of anaemia and goitre in the state. These indicate that anaemia is widely prevalent among pre-school children in the State (25% suffered from severe anaemia while another 65% manifested borderline anaemia. Discussed in detail in later sections). Tamil Nadu is not endemic to goitre but the problem does exist in the hilly areas of Nilgiris.

NUTRITION INTERVENTION PROGRAMMES IN THE STATE

4.31 Given the poor nutritional status of children in the State and high prevalence of nutritional deficiency disorders, the State Government decided to place greater emphasis on direct nutrition intervention through supplementary feeding programmes, as a short term measure to overcome malnutrition and consequent morbidity and mortality among children in the state.

4.32 The early 1980's thus saw the emergence/strengthening of several supplementary feeding programs. These include

- (1) Chief Minister's Nutritious Meal Programme (now called Tamil Nadu Government Nutritious Meal Programme - TNGNMP)
- (2) Tamil Nadu Integrated Nutrition Project (TINP)
- (3) Integrated Child Development Services (ICDS) and
- (4) Madras Urban Development Programme -Phase II (MUDP-II)

Table 4.7 provides the scope and coverage under each of these programmes.

TAMIL NADU GOVERNMENT NUTRITIOUS MEAL PROGRAM

4.33 Tamil Nadu Government Nutritious Meal Programme is the largest among all the supplementary feeding programmes in the state. Under the programme a mid-day meal is provided to 8.5 million pre-school and school going children (365 days for children upto class V and on all working days for children of classes VI to X). This scheme cost Rs. 175 crores annually and is entirely funded by the State. The meal provides 1/3 of child's daily calorie requirement and 1/2 of his protein requirement. Besides the primary objective of direct nutrition intervention, the scheme also aims at improving the school enrolment and attendance and reducing drop-outs, as the mid-day meal is a strong incentive for children to attend school.

4.34 An evaluation of TNGNMP carried out by Sri Avinashlingam Home Science College, Coimbatore, at 70 feeding centres indicates that there have been definite increases in the anthropometric measurement and decreases in prevalence of clinical signs of malnutrition, for all children participating in the programme, over a period of four months. However, the evaluation did not assess the nutritional status of children using weight for age criterion, and its impact on school enrolment and attendance.

4.35 With an emphasis on Early Childhood Care and Education (ECCE), the State Government has started imparting pre-school education to all children in the age group 2+ to 4+. For the purpose, all child welfare centres operating under TNGNMP have been converted to pre-school centres. The other objectives of the programme include promoting personal hygiene, imparting knowledge regarding health and nutrition etc.

TABLE 4.7

SCOPE AND COVERAGE OF SUPPLEMENTARY FEEDING PROGRAMMES IN TAMIL NADU

PROGRAMME	OBJECTIVE	PERIOD	COVERAGE	ANNUAL OUTLAY
1. Tamil Nadu Government Nutritious Meal Programme (TNGNMP)	To Provide - Supplementary meal - Improvement in school enrolment and attendance - Provide health check up and referral services	Since July 1982	- Whole state - 1.8 million pre-school children - 6.4 million school going children	Rs.175 Crores
2. Tamil Nadu Integrated Nutrition Project (TINP)	To Provide - Growth monitoring - Supplementary feeding on selective basis	Since November 1980	- 9 Districts - 6.4 lakh children in the age group - 6-36 months	Rs. 7 Crores
3. Integrated Child Development Services (ICDS)	To Provide - Health services (Immunisation, Vitamin A prophylaxis, Diarrhoea Management, Deworming) and referral services for children - Ante and post natal care to mothers - Change Knowledge, Attitudes and Practices (KAP) to ensure better nutrition care of children	Since 1975-76	- 65 projects - 1 lakh children - 0-2 years 2 lakh	Rs. 8.7 Crores

TABLE 4.7 (Contd)

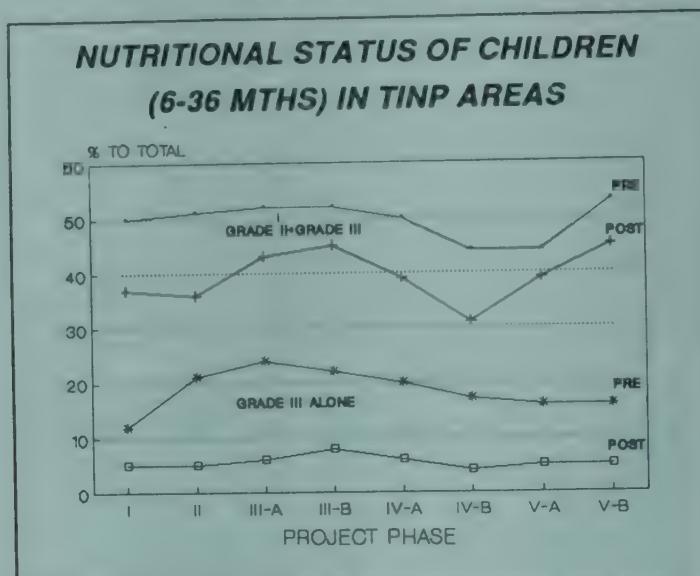
SCOPE AND COVERAGE OF SUPPLEMENTARY FEEDING PROGRAMMES IN TAMIL NADU

PROGRAMME	OBJECTIVE	PERIOD	COVERAGE	ANNUAL OUTLAY
	<p>and nursing mothers, which include:</p> <ul style="list-style-type: none"> - Supplementary Nutrition - Immunisation - Health check up and service - Non-formal pre-school education - Nutrition and health education for women 	children group 2+ to 4+	<ul style="list-style-type: none"> - 0.6 lakh pregnant and nursing mothers. 	Rs. 30 lakhs
4. Madras Urban Development Project (MUDP)	Similar to ICDS	Since 1980	<ul style="list-style-type: none"> - Madras - 12795 children in 0-5 years - 1437 pregnant and nursing mothers 	

TAMIL NADU INTEGRATED NUTRITION PROJECT (TINP)

4.36 TINP, a World Bank sponsored Programme was started on a pilot basis in Kottampatti block in 1980 and has been fully operational since 1982. The programme covers 10 districts in the state covering rural areas and extends nutrition and health related services to 1.1 million children in the age group 6-36 months and 0.28 million pregnant and lactating mothers (Annual outlay Rs 7 crores). The programme emphasises on monthly weighing and growth monitoring for all children in the age group 6-36 month in the area. The growth monitoring helps in identifying growth faltering and malnutrition and only these children are provided supplementary feeding in the form of a "laddu" containing a mixture of cereals, pulses, jaggery and vitamin and mineral supplements. The pregnant and nursing mothers are also selected for supplementary feeding based on a set of criteria. The programme has been successful in terms of its coverage of children. More than 90% of children in the project areas are weighed regularly. Further there has been a significant improvement in the nutritional status of children in all the project districts as can be seen from Exhibit 4.14. However, the level of severe malnutrition (Grade III) as assessed by TINP at the time of commencement of the project was far higher than that suggested by the NNMB surveys. Thus even after substantial improvement in the nutritional status of children in the project area, 30-45% (average 36%) of children continue to suffer from moderate to severe malnutrition.

EXHIBIT 4.14



4.37 The programme also covers health services (like immunisation, Vitamin A prophylaxis, deworming, iron supplementation, diarrhoea management), referral services for children and ante and post natal care for pregnant women. It emphasises on communication as central to imparting nutrition education and changing knowledge, attitudes and practices among mothers to achieve long term benefits under the programme.

INTEGRATED CHILD DEVELOPMENT SERVICES

4.38 Integrated Child Development Services (ICDS) is a Central Government programme introduced since 1975-76. It focusses on overall child development by providing a combination of services to pre-school children (<5 years) and pregnant and nursing mothers.

These include:

- Supplementary feeding
- Immunisation
- Health check up and services
- Non-formal pre-school education
- Nutrition and Health Education for women.

4.39 Under ICDS all children in the age group 6 months to 2 years and pregnant and lactating women are provided with food supplement called 'Sathu'. Children in the age group 2+ to 4+ in the project area are covered under TNGNMP. The combination of supplemental feeding and health services has had a positive effect on the nutritional status of children in the project areas. An evaluation done in March 1989 indicates that only 27% of preschool children in urban centres and 36% in rural centres suffer from moderate to severe malnutrition. The percentage of children suffering from severe malnutrition is in fact very low at 1.6 per cent in urban centres and 4.5 per cent in rural centres (Exhibit 4.15). This is substantial improvement when compared to the situation as assessed during 1979-80 base line survey carried out in some of the project areas (Exhibit 4.16).

EXHIBIT 4.15

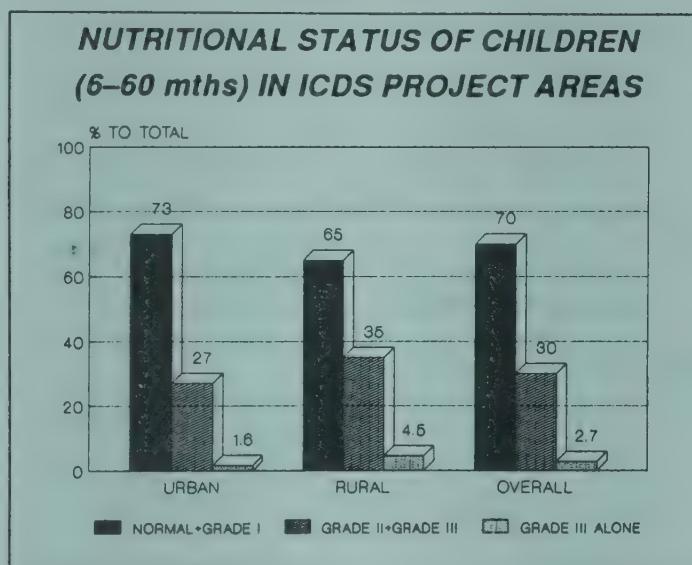
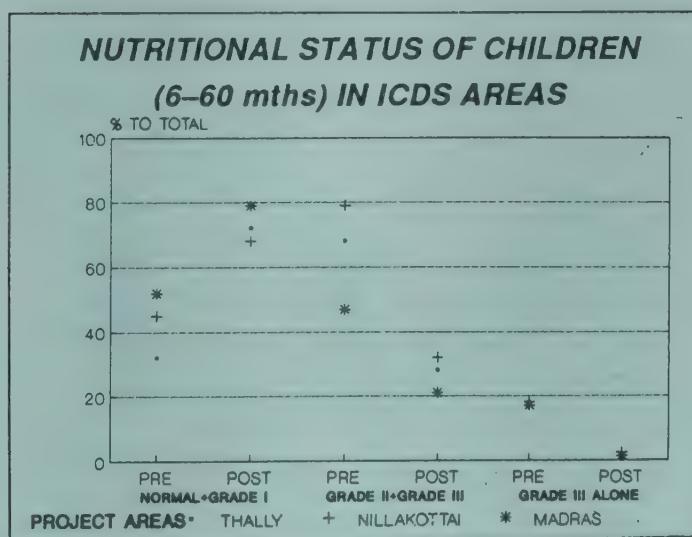


EXHIBIT 4.16



4.40 All these evaluations indicate that nutrition intervention programmes have made a significant impact on the nutritional status of children in the State. However, they fail to give a comprehensive picture of the nutritional status of children in the State due to differences in project areas, age group of beneficiaries and limited coverage. Thus, there is an urgent need to carry out an extensive survey to assess the nutritional status of children in the State.

4.41 Clinical signs of malnutrition are also assessed under various programmes like TINP, ICDS, TNGNMP etc. The prevalence rates vary due to differences in district and population coverage as well as the skills of survey workers in recognising deficiency symptoms. Thus, data from all the different sources are not comparable and hence are not presented here. However, they all point to common conclusions:

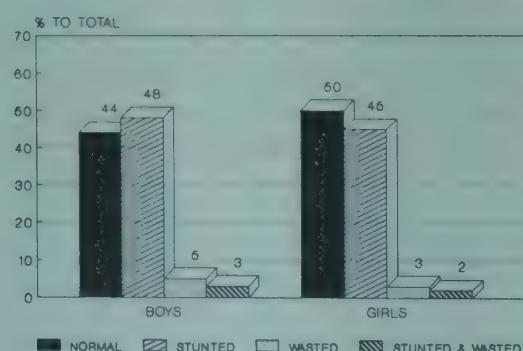
- (1) The nutritional status of children in the State continues to be poor as assessed based on weight for age criterion and by prevalence of clinical signs of malnutrition. conjunctive xerosis, bitots spots, angular stomatitis, emaciation, marasmus and anaemia are the most common nutritional disorders and are widely prevalent among the children in the State.
- (2) Consequent upon the introduction of various supplementary feeding programs and Vitamin A prophylaxis programme nutritional status of children is improving and prevalence of PEM and Vitamin A deficiency disorders is on the decline specially in the project areas covered under TINP, ICDS, DANIDA and TNGNMP.
- (3) The incidence of Vitamin B (Riboflavin) deficiency is large and on the increase. This problem is not being addressed currently under any of the MCH care programmes and there is an urgent need for Government intervention in this area. While designing any effective programmes in this area, water solubility of Vitamin B and aggravation of Vitamin B deficiency during measles and upper respiratory infections due to excess secretion in urine will have to be borne in mind.

STUNTING AND WASTING

4.42 Of late, the nutrition experts recommend the use of Waterlow's grades which consider height (linear measurement) along with weight (body measurement) in assessing the nutritional status of children in terms of acute (short duration) and chronic (long duration) types of malnutrition. Exhibit 4.17 gives the classification of pre-school children in rural Tamil Nadu using Waterlow's grades.

EXHIBIT 4.17

**DISTRIBUTION OF RURAL CHILDREN
(1-5 YRS) WATERLOW'S CLASSIFICATION**



Source: NNMB Survey

The Exhibit indicates that close to 48% boys and 45% girls in the State suffer from stunting in rural Tamil Nadu, suggesting chronic nutrition problems. Compared to this, the proportion of children suffering from acute malnutrition either singly or jointly with chronic malnutrition is quite small at 5 and 8% respectively.

WATERLOW'S CLASSIFICATION

Method of classification used is as follows:

Stunting: Height for age less than 90% of standard

Wasting: Weight for height less than 80% of standard value

Normal: Children who do not exhibit stunting or wasting

Median values of heights and weights of well-to-do Indian children are used as standards.

GROWTH MONITORING AND ITS IMPACT ON NUTRITIONAL STATUS OF CHILDREN

4.43 In recent years, growth monitoring as a tool for nutrition surveillance has found wide spread acceptance (both TINP and ICDS undertake monthly weighing of children in the age group 6-36 months and quarterly weighing for children in the age group 36-60 months). In fact TINP places emphasis on monitoring of growth as a form of nutrition education with short term supplementary feeding as a corollary rather than dominant activity. This has paid off as substantiated by a UNICEF survey which indicates that mothers' interpretation of growth lines on growth cards is "accurate and impressive". Mothers were able to identify growth faltering, malnutrition and a relapse with considerable skill and consistency. (Some 95% mothers correctly interpreted normal growth, 89% understood poor nutrition status and 85% appreciated the concept of growth faltering). The assessment team found that the mothers spontaneously used the card while explaining reasons for deviant growth, suggesting the effective use of the growth cards.

MATERNAL MALNUTRITION AND ITS IMPACT ON NUTRITIONAL STATUS OF CHILDREN

4.44 Maternal malnutrition affects both the foetus and the new born directly via birth weight, levels of foetal stores of nutrients and laying down reserves for adequate lactation. In fact many studies have attributed to the maternal malnutrition and low child bearing age as the principal causes of high incidence of low birth weight (LBW) and perinatal mortality rate (PNMR) in the State. Though exact estimates of LBW rate in the State are not available, due to non-recording of weight at birth, some community based/hospital studies (Table 4.8) estimate the incidence to be high at 18-20% in urban areas and 23-38% in rural areas.

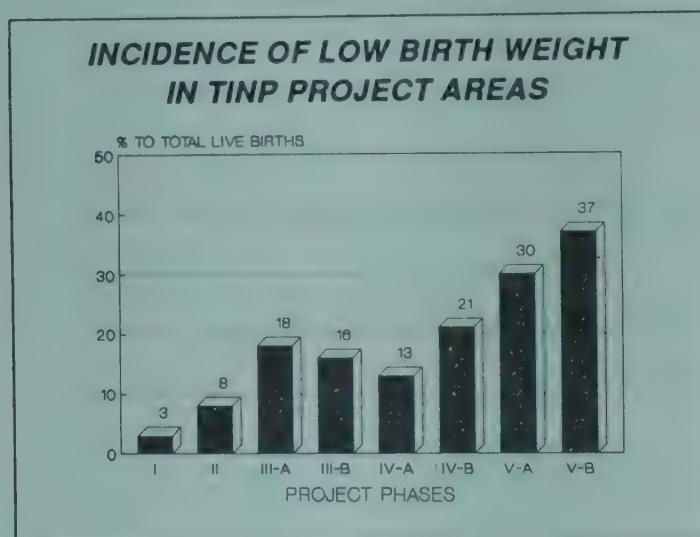
TABLE 4.8
INCIDENCE OF LOW BIRTH WEIGHT

SOURCE	URBAN/RURAL	PROJECT AREA	YEAR	NO. OF BIR- THS COVERED	LBW%
ICMR	Urban	Madras Slums	1981-83	962	18.4
Low cost Neonatal care Project of Ford Foundation	Rural	LCNC unit at Kanchipuram	1988	2519	22.6*
Dr. Florence Theophilus	Urban	Children Hospital, Madras	1982	934	25
Institute of Social Paediatrics	Rural	Sendamangalam	1984	1051	38
	Urban	Madras ICDS Project IX RSRM Hospital, Madras		1040	21
				31000	29

* Includes incidence of Term LBWs and Pre-term births

4.45 TINP authorities also monitor the incidence of LBW in the State. However, the data is not reliable as the estimate is based on information provided by the mothers, rather than actual weighing at birth. Exhibit 4.18 which gives the incidence rates in various project areas indicates that the rate varies from district to district and is the lowest among earlier project areas. This may indicate that supplementary feeding coupled with good ante-natal care has made a significant impact in lowering the incidence of LBW in the project areas.

EXHIBIT 4.18



4.46 A study by Indian Council of Medical Research (ICMR) (November 1981 to March 1983), peri-natal mortality rate (PNMR) was high at 109 for LBW infants against 35 for normal infants. In fact LBW was the underlying cause of death in more than 40% of early neo-natal deaths. The ICMR study also attempts to identify the high risk factors affecting pregnancy

outcomes. On the nutritional side, the maternal height (<140 cm), Weight (<35 kg), mid arm circumference (<20 cm) and blood haemoglobin levels (<8 gms %) have a definite impact on the incidence of low birth weight and peri-natal mortality in the State (Exhibits 4.19, 4.20 and 4.21).

EXHIBIT 4.19

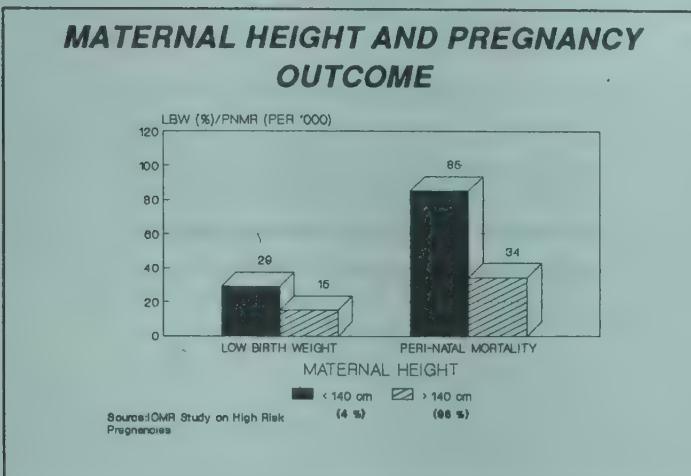


EXHIBIT 4.20

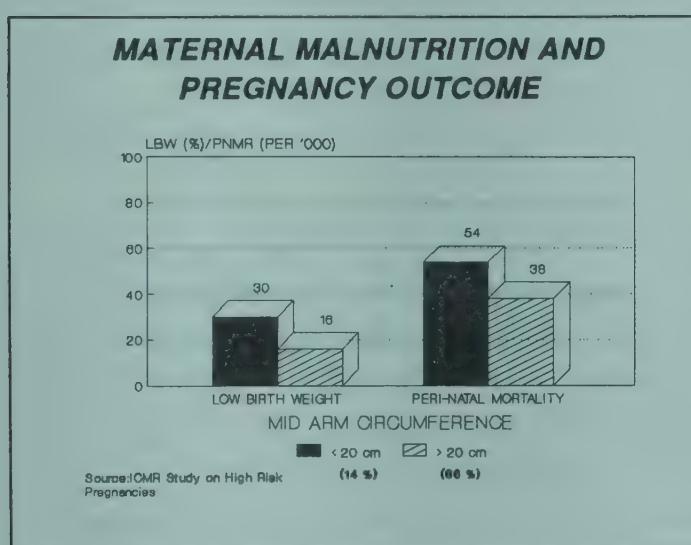
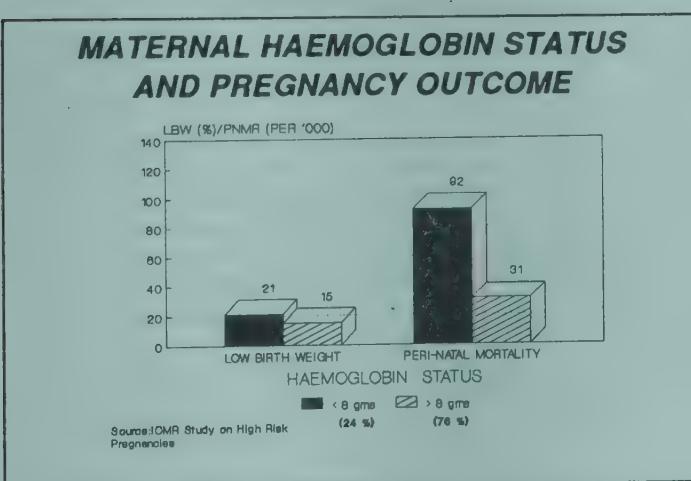


EXHIBIT 4.21



4.47 The age of the mother (< 20 years) is the other important factor leading to high incidence of LBW and PNMR. It is estimated that 25% of girls in the age group 15-19 years get married in Tamil Nadu. The age specific fertility rate in this age group is estimated at 60 per 1000

which indicates that 25% of married girls in this age group have children each year. Thus even by the conservative census estimates, there are 1,80,000 teenage pregnancies in the State every year. Incidence of low birth weight and PNM is much higher among teenage mothers. According to a survey by Dr.S. Jayem (ICMR) LBW rate was 30% and PNMR was 56/1000 among teenage mothers vis-a-vis 16.5% and 33/1000 for the mothers in the age group 20-30 years.

4.48 Most of the nutrition intervention programmes in the State (ICDS, TINP, MUDP) recognise the crucial linkage between maternal malnutrition and poor nutrition and health of the child. Thus, these programmes include supplementary feeding of pregnant and lactating mothers as an integral part of the services. However, coverage of eligible women under these programmes remains poor at 30-35% due to variety of reasons like lack of emphasis on this component, non-participation by women etc.

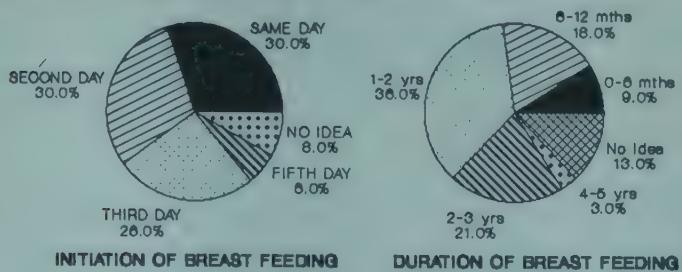
BREAST FEEDING AND WEANING PRACTICES

4.49 Though the practice of breast feeding is near universal in the State, it is the short duration of breast feeding especially in the urban areas and the practice of discarding colostrum (which is invaluable in building immunity in the new born) which are harmful. It is believed that diarrhoea of the new born is essentially a "colostrum deficiency" syndrome, whereas infant diarrhoea (especially in 6 to 9 month old babies) is more common in bottle fed babies. In the past, there has been a lot of emphasis on creating awareness regarding breast feeding, while education on aspects like colostrum, duration of breast feeding and weaning has been poor.

4.50 A survey of 12000 families in 16 districts of the State, conducted by Avinashilingam Home Science College, Coimbatore in 1987 indicates that only 30% of mothers initiated breast feeding on the day of birth. The remaining 70% of mothers initiated breast feeding on day 2 or 3. Practice of giving pre-lacteal feeds was also widely prevalent, specially in the households where breast feeding is started only on day 2 or 3 (Exhibit 4.22). Sweetened water was most popularly used. In terms of duration of breast feeding 25% of the mothers stopped breast feeding within 1 year. Another 36% stopped before the end of the second year. In terms of duration of exclusive breast feeding, 60% of mothers stop by the 3rd month and the reason is primarily inadequate quantity of breast milk or lactation failure. Animal milk and commercial milk were most widely used supplementary feeds. Among upper income urban households there was a trend towards early stoppage of breast feeding for reasons other than lactation failure. Further, the duration of breast feeding showed an inverse relationship with education of mother and family income.

EXHIBIT 4.22

BREAST FEEDING PRACTICES-TAMIL NADU

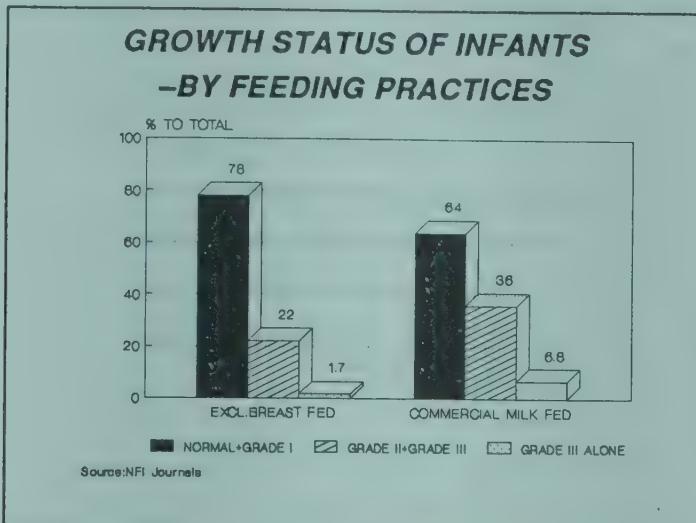


Source: Report on Pre-evaluation Survey of TMCHEP

4.51 The percentage of infants who are never breast fed is small in the State (3% as indicated in a survey by Nutrition Foundation of India) and the reasons in most cases are the lack of or inadequate breast milk.

4.52 In fact the use of commercial milk food is widely prevalent in the State and it is estimated that the State accounts for more than 1000 TPA of milk powder consumption. Infact a study conducted by NFI in Madras region shows that 60-70 percent of infants in large cities, 40-50% in small towns and 36% in rural areas receive commercial milk foods during their first year. More than 80% of these infants were given commercial milk foods before the age of 4 months. A study by NFI measuring growth performance of commercial milk food fed infants and breast fed infants showed that growth performance was better among breast fed infants (Exhibit 4.23)

EXHIBIT 4.23



4.53 In terms of weaning practices the survey by Avinashilingam Home Science College, Coimbatore, reveals that only 25% of mothers started the weaning process by 6 months. Most of them started weaning at one year or later. The weaning food preparations commonly used are rice and dhal, idli, ragi and biscuits. Use of vegetables and fruits is very low. Consumption of commercial weaning food is also widely prevalent. It is estimated that 800 TPA of commercial cereals are consumed in Tamil Nadu which represents more than 20% of the All India consumption. The survey by Nutrition Foundation of India confirms this as it estimates that 30-40% of infants in large cities, 20-30% in small towns and 12% in rural areas receive commercial cereals at the weaning stage. In fact, most households in the State spend 10% of their income on these commercial foods.

4.54 The health personnel and doctors have a major role to play in encouraging appropriate breast feeding and weaning practices. While a great majority of 67-70% of mothers receive no advice, the rest at times receive wrong advice. A survey of doctors, nurses and grass root level health and nutrition workers conducted by the Institute of Social Paediatrics reveals that their knowledge on breast feeding and weaning practices is poor and there is an urgent need for dissemination of scientific knowledge on this aspect,

4.55 Awareness of mothers regarding advantages of colostrum and early breast feeding needs to be created. Further they need to be educated regarding the need for special diets to ensure availability of sufficient quantity of breast milk to the child. In fact according to a survey by Avinashilingam Home Science College, 50 percent of lactating mothers



considered their normal diet to be adequate during lactation. This lack of knowledge coupled with widespread maternal malnutrition affects the lactation performance of mothers and in turn the health and nutrition of the child.

VITAMIN A DEFICIENCY AND BLINDNESS

4.56 It is estimated that there are 192,000 blind people in the State of which more than 80,000 are children. In the past Vitamin A deficiency was the cause of blindness in more than 50% of cases in the state as substantiated by a survey of 150 blind children carried out in 1980 by the Institute of Social Paediatrics. Further as seen in the earlier sections, Xerophthalmia is widely prevalent in the State, though the exact incidence is difficult to assess due to wide variations in prevalence rates as various studies. prevalence of from year to year the magnitude of (Corneal xerosis leading to blindness) is not accurately due to small sample sizes.

VITAMIN 'A' DEFICIENCY - A PUBLIC HEALTH PROBLEM

Prevalence rates in excess of 0.5% for Bitots spots and 0.01% for active Corneal lesions are used as the criterion for considering the existence of Vitamin A deficiency as a major public health problem.

community level studies available assessing the prevalence rates for Xerophthalmia but their estimates vary widely. The reasons are many which include use of subjective judgement rather than an objective test, small sample sizes, regional variations in prevalence rates and differences in sampling designs. Thus it is difficult to assess the exact magnitude of the problem based on these surveys. However, they all point in one direction that Vitamin A deficiency is wide spread and a major public health problem in the State.

XEROPHTHALMIA

The known clinical manifestations of Vitamin A deficiency are ocular which are referred to by a blanket term xerophthalmia. More specifically it includes:

X.1 A :Conjunctive Xerosis which refers to the dryness of the conjunctiva.

X.1 B :Bitots spots which are white or pale grey triangular plaques appearing on dry conjunctiva.

X2 :Corneal Xerosis which is the dryness of the cornea.

X3A :Corneal ulcer.

X3B :Keratomalacia which refers to bilateral lesion with softening or perforation of cornea and at times prolapse of the iris.

XN :Night Blindness- the difficulty in seeing clearly at dusk or night.

XS :Corneal scar caused due to damage to cornea.

It is the more severe form of Vitamin A deficiency with corneal involvement (X3 usually) which leads to irreversible blindness. The rest are reversible with correctional measures aimed at ensuring the adequate serum levels of Vitamin A.

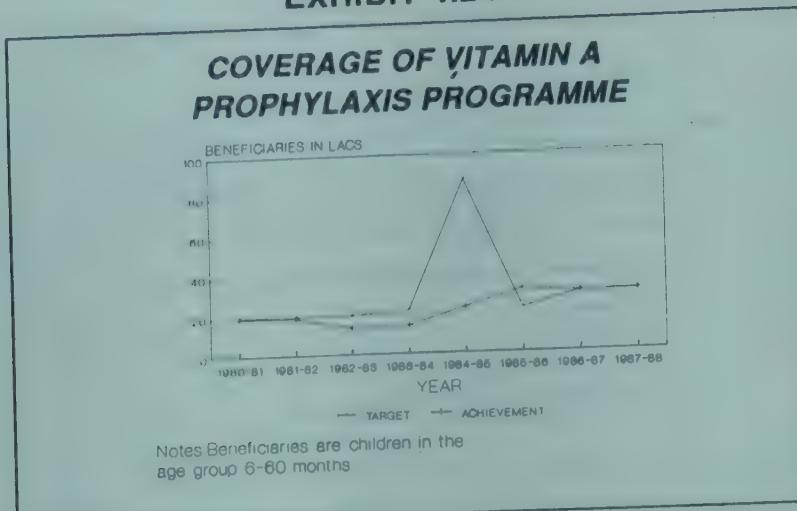
TABLE 4.9
PREVALENCE OF XEROPHTHALMIA IN PRE-SCHOOL CHILDREN

STUDY	YEAR	SAMPLE SIZE	PREVALENCE RATE (%)		
			CONJ. XEROSIS	BITOTS SPOTS	CORNEAL LESIONS
1. NNMB Rural	1978	531	1.3	3.4	NA
	1979	401	0.7	2.2	NA
	1980	568	1.6	-	NA
	1981	430	0.5	1.4	NA
	1982	598	3.0	3.8	NA
2. NNMB urban	1978	202	-	2.9	NA
3. Central Nutrition Bureau	1987- 1988				
- Ramanathapuram		264	8.0	-	-
- Chingleput		614	14.0	4.0	-
- Madras ICDS		2829	3.0	0.1	-
4. Institute of Social Paediatrics- Madras ICDS Project IX	1984		NA	4.0	0.11
	1988	9664	NA	NA	0.01
- Senthamangalam	1984		NA	12.0	-
5. Dept. of Public Health - Periakulam District	1985	451	9.0	1.8	NA
6. Vision Research Institute - Madras	1989	709	18.2	1.7	0.5

4.57 The Government of India recognises this problem and has been putting a lot of emphasis on prevention of Vitamin A deficiency and nutritional blindness by administration of Vitamin A prophylaxis programme throughout the country. The program ensures that the hepatic stores of Vitamin A are built up periodically (since the liver can store large quantities of Vitamin A and release them periodically) through an oral administration of 200,000 IU of Vitamin A dissolved in oil, to children aged one to five years, once in six months. Though this program has been in operation since 1971 its coverage used to be limited. In recent years its coverage has been extended and a thrust has been ensured by way of its inclusion as

a critical component of TINP, ICDS and other Mother and Child Health care programmes. Exhibit 4.24 provides the target and achievement in terms of coverage under the program.

EXHIBIT 4.24



Though the achievement has been good vis-a-vis targets, the targets themselves are underrated and the percentage coverage of eligible children remains low at less than 36%. The coverage is high at 70-80% in areas where special programs like TINP and ICDS are operating while in the remaining part of the State the coverage is very low (<15%) as brought out very clearly in DANIDA evaluation reports. The reasons for poor coverage are non-availability of Vitamin A as it is imported and practical problems in administering an oral dose.

4.58 The prevalence of Vitamin A deficiency disorders seems to be on the decline, at least in the project areas. This can be seen from a study of pre-school children carried out by the Institute of Social Paediatrics. Table 4.10 which gives the results of these longitudinal studies indicates that the prevalence of xerophthalmia is on a decline in both rural and urban project areas which have been benefiting from National Vitamin A prophylaxis programme.

TABLE 4.10
TRENDS IN PREVALENCE RATE OF XEROPHTHALMIA IN
PRE-SCHOOL CHILDREN (%)

	RURAL SENDAMANGLAM BLOCK			URBAN-MADRAS			
	1982	1983	1984	1982	1983	1984	1988
Keratomalacia	0.005	-	-	0.78	-	0.012	0.01
Bitots spot	25%	18%	12%	3.3%	-	4%	-
Night Blindness	-	-	-	1.2%	-	0.5%	-

Note: Prevalence of conjunctive xerosis was not assessed during the survey.

4.59 Given universally high prevalence rates of Xerophthalmia in the State, the future strategy should aim at increasing the coverage of Vitamin A prophylaxis program. This could be achieved by its integration with Universal Immunisation Program. Further in the past the programme has focussed only on pre-school children as it is at that stage that it leads to blindness. However the prevalence rate is equally high among school going children, specially for Bitots spots which increase with age. Recently the State Government has decided to provide Vitamin A tablets daily to all school going children covered by TNGNMP. Lactating mothers also need to be included under this program to ensure that the infants get adequate intake during the first six months.

4.60 Many recent studies in South India have observed that serum levels of Vitamin A fall significantly during an attack of measles and diarrhoea. In fact acute episodes of infection almost invariably precede the development of corneal lesions. Further corneal lesions are almost always associated with severe forms of protein-energy malnutrition (PEM) like kwashiorkor and marasmus. Thus the Vitamin A prophylaxis program should lay a special emphasis on the children suffering from these illnesses to avoid corneal complications which almost always lead to blindness.

4.61 In the long run, fortification of some common foods with Vitamin A would be a more cost effective strategy than direct intervention. Some isolated attempts have already been made, for eg. milk fortification by Mother Dairy in New Delhi and universal fortification of vanaspati. However, these are regional in character on account of either regional production or consumption. A choice of a more universally consumed food item and universal coverage of production centres would ensure the supplementation for all.

4.62 In the long run, emphasis would have to be also placed on improving the dietary intake of Vitamin A (which as seen earlier is very low). A number of locally available green leafy vegetables have high Vitamin A content. Adequate consumption of these together with milk (which currently meets 60% of a child Vitamin A requirement) and yellow skinned fruits could go a long way in improving Vitamin A intake. This could be achieved through changes in knowledge, attitudes and practices (KAP) of people which could be achieved through appropriate communication strategies. In fact, in recent years all the Mother and Child Care (MCH) programs are placing a lot of emphasis on the communication component which aims at changing the KAP in rural areas.

IRON DEFICIENCY

4.63 Unfortunately, there has been no State wide survey for assessing the prevalence of anaemia in Tamil Nadu. The projects like TINP, DANIDA, ICDS also do not assess the status of their beneficiaries in respect of anaemia as it requires a blood test to assess the blood haemoglobin levels. There are few isolated studies which assess the prevalence rates in few districts.

4.64 The Tamil Nadu Salt Corporation sponsored a survey to assess prevalence of anaemia in 2 districts of Dharmapuri and Ramanathapuram in 1986. Though survey results cannot be extrapolated to the State as a whole, they do provide some indications of the magnitude of the problem in the State. Exhibits 4.25, 4.26 and 4.27 which give the findings of the

survey indicate that the problem is widely prevalent among pregnant mothers, women in the child bearing age and pre-school children. In these population groups even on a conservative estimate more than 12% suffer from severe anaemia (with haemoglobin levels which were less than 75% of recommended level) and another 60% suffer from borderline anaemia (with haemoglobin levels between 75-99% of recommended level).

4.65 The high prevalence of anaemia in the State is attributed to:

- (1) Dietary deficiency of iron due to poor absorption from predominantly cereal based diets which contain oxalates and phthalates.

EXHIBIT 4.25

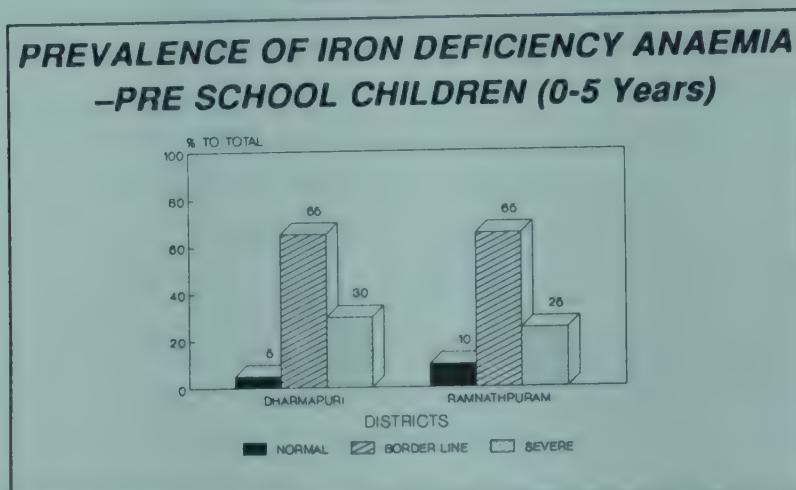


EXHIBIT 4.26

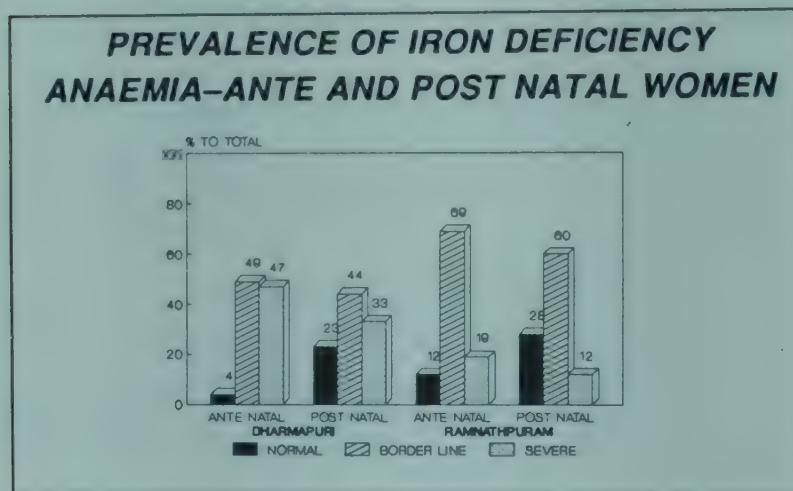
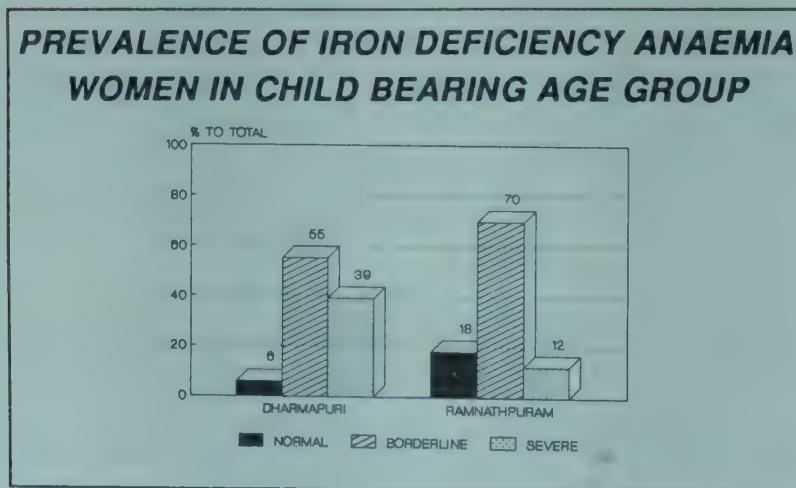


EXHIBIT 4.27



- (2) High incidence of worm infestation among the pre-school children which prevents iron absorption (A micro-biological survey of 638 pre-school children in the State showed that 60% of children were infested with worms, mostly roundworms).
- (3) Prevalence of Vitamin A deficiency, poor intake of proteins and recurrent infections which also affect iron absorption.

4.66 Severe anaemia during pregnancy leads to increased foetal and maternal mortality, premature delivery and low birth weight. The incidence of foetal wastages (includes abortions and still births), premature delivery and low birth weight is very high in the State. According to a cohort community based study conducted by ICMR in urban slums of Madras (population 30,000), the abortion rate was 7.5%, while still birth rate was 22/1000. The incidence of low birth weight was also high at 18.4%. In rural areas, the problem seems to be even greater. Though no community level data is available, a study of deliveries at Kanchipuram neo-natal health unit (supported by Ford Foundation) indicates that the still birth rate was as high as 72/1000 while the incidence of premature delivery and low birth weight was 3% and 23% respectively.

4.67 On the other hand, severe anaemia in children is a health hazard as it impairs their immune function as well as reduces their learning ability. Recognising this, as a short term measure towards correcting severe anaemic situation of women and children, the Government of India undertook the administration of therapeutic doses of iron to pregnant women and pre-school children, through MCH programmes like ICDS and TINP. Currently the programme covers 8 lakh pregnant mothers and 15 lakh pre-school children (6-36 months) per annum (Exhibits 4.28 and 4.29). At a later date the programme aims to include the lactating mothers and older age group children also under the scheme. Though the coverage seems quite good on paper at 60% and 40% for women and children respectively, the programme evaluation by ICMR reveals that the project has not achieved the desired impact due to inadequate and irregular supply of tablets, poor coverage of target beneficiaries and non-compliance by beneficiaries due to gastric irritation caused by poor tolerance to iron and lack of knowledge about anaemia. In fact the evaluation reports indicate that only 50-60% of target population received the required supplement of which almost 80-90% did not use them regularly. Thus for the programme to achieve the desired impact higher awareness will have to be created regarding anaemia and its effects on health of an individual. Communication strategy should also aim at improving the dietary intake of iron. Further iron supplementation will have to go hand in hand with Vitamin A and anti-helmenthic therapy in children to achieve the full impact.

EXHIBIT 4.28

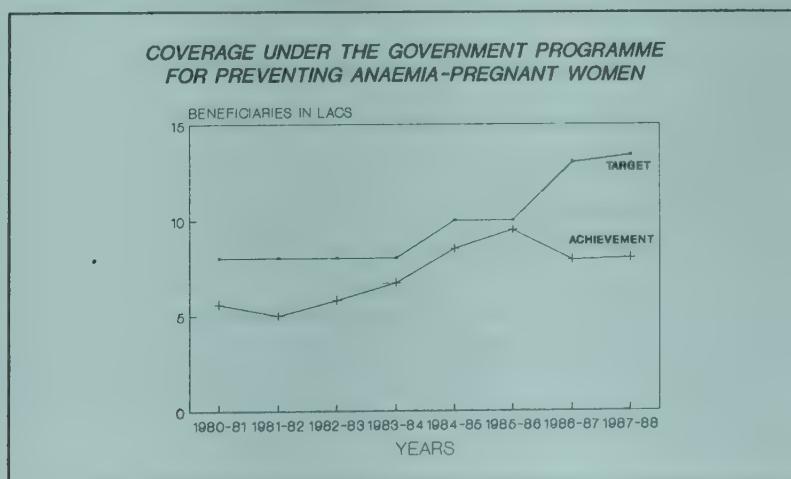
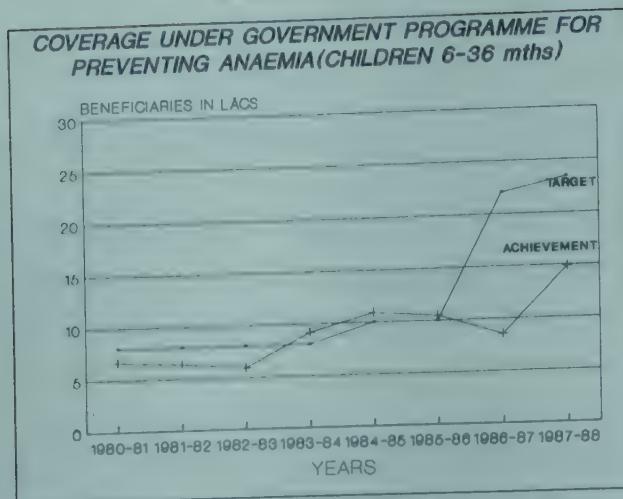


EXHIBIT 4.29



4.68 It is recognised that in the long run fortification of common salt with iron is a more cost-effective solution to the problem of anaemia. Tamil Nadu Salt Corporation has undertaken Iron Fortified Salt (IFS) project and is commissioning a plant to manufacture IFS in Ramanathpuram district with UNICEF assistance. The project will have an initial capacity of 15,000 TPA, which constitutes only 5% of State's consumption requirement. Initially IFS is planned to be supplied to the target population through TNGNMP and Social Welfare Departments schemes for the pre-school children and the expectant mothers.

IODINE DEFICIENCY

4.69 Iodine deficiency is a major problem in India as it is estimated that more than 40 million people (located in sub-Himalayan belt) suffer from the endemic goitre. It is estimated that 15% of children in these goitre endemic areas suffer from varying degrees of mental retardation. In view of this National Goitre Control Program was set up which aims at universal iodisation of common salt by 1992. Tamil Nadu which, is the second largest salt production centre accounting for 17% of All India production has lagged behind in this as less than 2.5% of its salt production is iodised.

4.70 Consumption of iodised salt in Tamil Nadu is almost negligible. Tamil Nadu is a low endemic State as the incidence of goitre is restricted to hill areas of Nilgiris and Coimbatore and area along the banks of Cheyyar river in North Arcot where incidence rate is .01%. However, there has been no State-wide study to corroborate this.

COMMUNICATION

4.71 Communication plays an important role in changing knowledge, attitudes and practices of people. To that extent it can be an important tool for achieving better nutrition and health for children. Communication strategies should aim at creating greater awareness among mothers and other members of the family towards food habits, nutritive value of foods, growth monitoring and evaluation, nutritional disorders and better home management of children's diseases. This could lead to greater consciousness regarding nutrition and help to achieve some of the goals of nutrition intervention programs at the household level. This is important for the long term success of the nutrition intervention programs. TINP in fact includes communication component as an integral part of the project and aims to achieve the desirable changes in KAP through the use of community level and mass media based communication strategies.

4.72 The Broad communication strategy adopted by TINP comprises of:

- (1) A separate organisation for the communications component to ensure the right emphasis.
- (2) The use of field level workers as "key communicators".
- (3) Greater emphasis on community level education through house visits and group activities.
- (4) Supplementing community level education with mass media for creating awareness.
- (5) Emphasis on training of field workers with public recognition of good performance.
- (6) Monitoring of communication activity and testing actual reach and understanding.

4.73 In fact a recent survey of 1500 beneficiary households in 60 CNCs was conducted with a view to evaluating the communication strategy and assessing its impact on knowledge, attitude and practices regarding key components of the project. The survey findings reveal that:

- (1) The prime strategy of depending on CNWs as the key communicators in the project area has been very effective. However, MPHWs— have been relatively less effective as communicators.
- (2) Certain themes like Weighing, Diarrhoea management, Deworming and Immunisation have created a high level of awareness and practice. Others like Colostrum, Supplementary feeding and Ante-natal care have not been as readily accepted (see Table 4.11). The knowledge of preventive aspects is also poor.

TABLE 4.11
KAP REGARDING KEY COMPONENTS OF TINP

	KNOWLEDGE	ATTITUDE	PRACTICE
Weighing	Good	Positive	Good
Diarrhoea Management	Moderate	Neutral	Moderate
Vitamin A	Good	Positive	Good
Immunisation	Good	Positive	Good
Breast feeding (Colostrum)	Poor	Neutral	Moderate
Weaning	Moderate	Neutral	Moderate
Ante-natal care	Poor	Neutral	Moderate

- (3) Communication effectiveness as measured by the extent of awareness and practice of themes, has been lower in the hamlets when compared to the main villages and among scheduled caste and illiterate mothers as compared to the higher caste and literate mothers.
- (4) While many communication media such as the flash card and the flip book have been significantly utilised and have also been effective, other media such as films, film strips and folk media have not been used much and have not been very effective.

5. Education

5.1 Education affects directly the quality of people's lives, as well as the prospects of improving it. A literate population is desirable in itself as it increases the access to knowledge and the capacity to avail of opportunities. Higher education improves the quality and productivity of work and has a bearing on the demographic and health status of the population by shaping the attitudes of people.

5.2 It is true that there is a broad correlation between the level of overall economic development attained by a country/region on one hand and the education and health status of its population on the other. However there are several striking examples to show that high levels of per capita income are not a necessary pre-condition for achieving universal literacy, fairly high standards and public health. The experience of China, Cuba, Vietnam, Sri Lanka and within India, Kerala, show that it is possible to attain a high level of literacy and reduce mortality to levels comparable with that of advanced countries even at relatively low levels of per capita income.

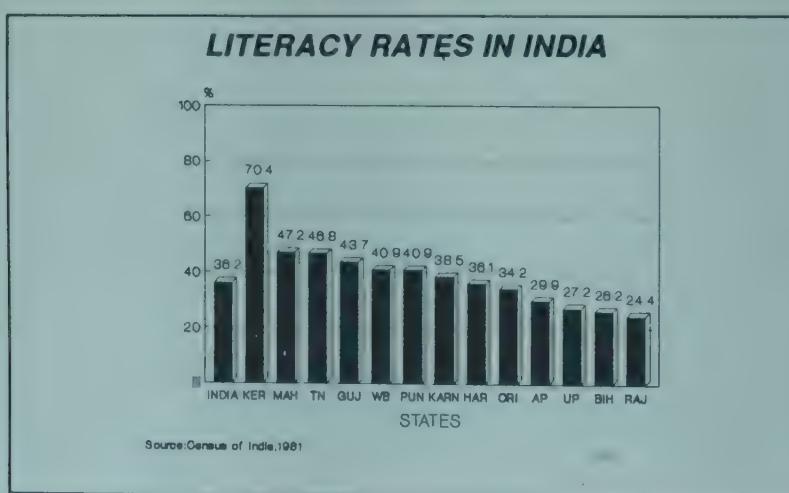
LITERACY

5.3 India has adopted the UNESCO definition of literacy ie. a person who can read or write a simple sentence in any language is termed literate for the purpose of census classification. Based on this definition also the percentage of literates to the total population in the country stood at 36% during the 1981 census. The effective literacy rate (after excluding the 0-4 age group) is a more meaningful indicator of the literacy level in the country. This is estimated at 42% against the general literacy rate of 36% in 1981. This means that more than 340 million Indians (excluding children below 5 years) are illiterate.

LITERACY IN TAMIL NADU

5.4 The literacy rate varies considerably among various States as indicated in Exhibit 5.1. The wide disparities in the literacy rates in various States are the result of the differences in the educational opportunities available in the State and the attitudes of people towards education. Tamil Nadu ranks 3rd among all the States with literacy rate substantially above the national average. However, it lags far behind the neighbouring State of Kerala.

EXHIBIT 5.1



PROGRESS OF LITERACY IN TAMIL NADU

5.5 Exhibit 5.2 and Exhibit 5.3 which provide the progress of literacy in Tamil Nadu and India respectively since 1951 indicates that the literacy rate at the State and national level has improved gradually since independence. However, in the absolute terms, while the number of illiterates has been increasing at the national level due to the rising population and the backlog of adult literacy, it has remained more or less static in the state indicating good coverage by the education system.

EXHIBIT 5.2

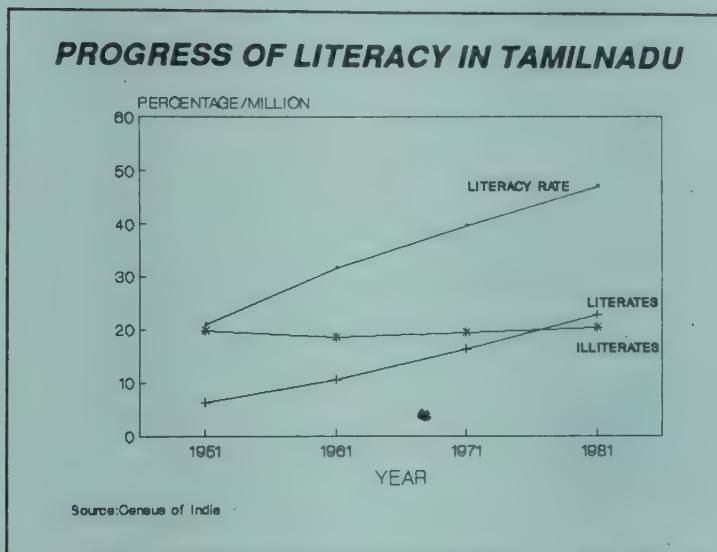
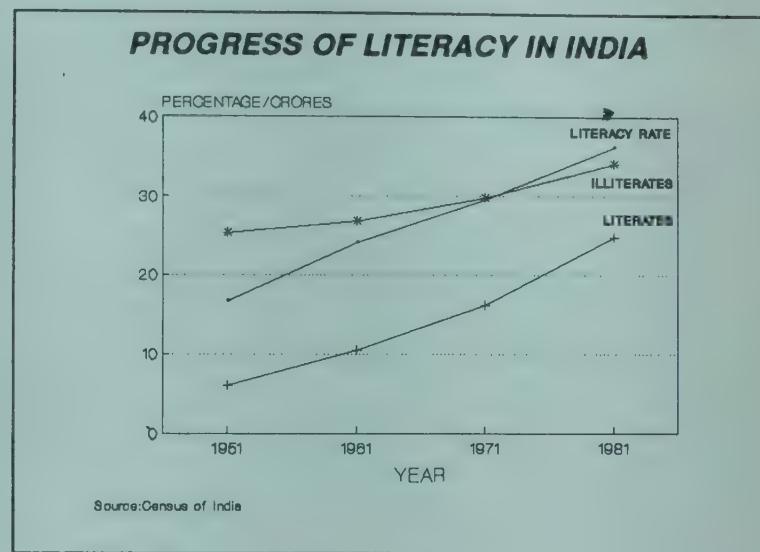


EXHIBIT 5.3



NATIONAL POLICY ON EDUCATION

5.6 This achievement is inadequate when viewed in the context of Article 45 of the Constitution which has enshrined free and compulsory education for all children upto the age of 14 years. While this goal was to be achieved within 10 years of the enactment of the Constitution in 1950, the bulk of the country's population still remains illiterate. This does not mean that there have been no efforts on the part of the Government. In fact, the efforts in this direction have been tremendous by expanding the education facilities particularly in the rural areas, attracting more children to school and retaining them and appointing competent teachers in the schools. However, though high enrolment at the primary level has been achieved as a result of these measures, it has failed to make a significant impact on the literacy level due to high drop out rates which are the result of economic compulsions and the general apprehension about the relevance of education. The quality of education also remains poor and as widely observed many children completing class V are unable to read or write.

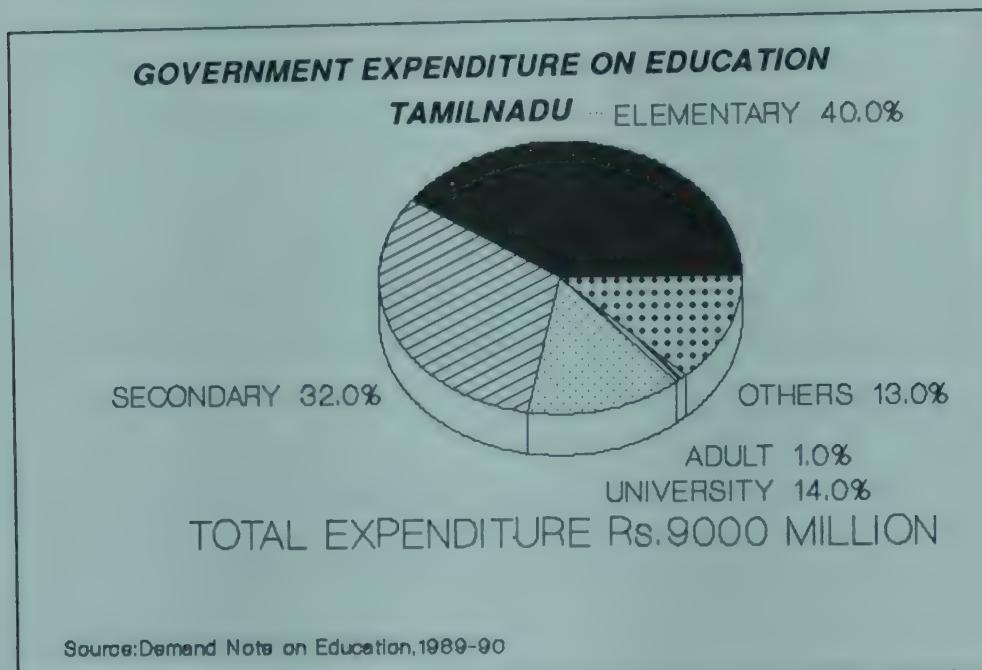
GOVERNMENT EXPENDITURE ON EDUCATION

5.7 Education is a concurrent subject with primary responsibility for funding endowed on the State. It is estimated that most State Governments spend more than 20 percent of their revenue budget on education while the Central Government spends 1.5 percent of its revenue expenditure on education. While the State Government funds go towards providing the basic education infrastructure, Central government funds are used for financing special programmes like non-formal and adult education, vocational training, special

institutes for higher studies etc. Together, more than 3.8 percent of GDP is spent on education. This is higher than that in many of the developing countries but lower than that in the developed countries.

5.8 The Government of Tamil Nadu is committed to the progress of education in the State and it is given top priority in terms of budget allocation with 22 percent of the total expenditure on revenue account apportioned to the subject. This represents more than 4.5% of Net State Domestic Product. The budget estimate for 1989-90 is Rs.900 crores which is divided among various components as shown in Exhibit 5.4. More than 40% of revenue expenditure on education goes towards primary education (Standard I-VIII) while another 32% is spent on secondary education (Standard IX-XII). It is estimated that more than 70 percent of this expenditure goes towards payment of teachers salaries and another 20 percent towards financing the noon-meal schemes.

EXHIBIT 5.4



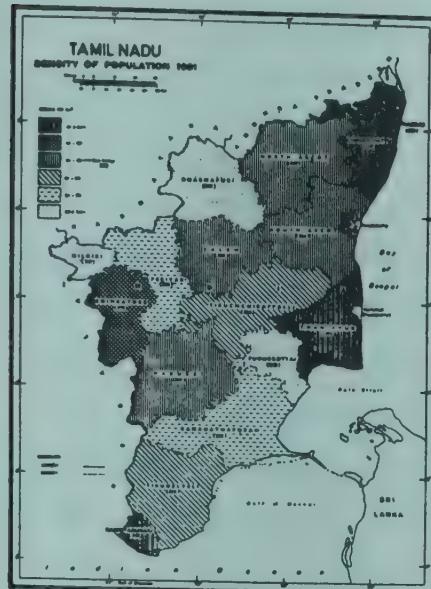
5.9 The annual expenditure per student ranges from Rs.345/- at the elementary level to Rs.1940 at the secondary level averaging at Rs.540. At the University level it is much higher at Rs.6250 per student. In per capita terms, the annual expenditure on education is Rs.165.

LITERACY IN DISTRICTS

5.10 Within the State also there are wide disparities in literacy levels between districts. Of the State's 16 districts (old classification) the highest extent of literacy is in the city district of Madras (68.4%), followed by Kanyakumari (63.9%). Kanyakumari district which borders Kerala State and formed a part of Kerala prior to the State's reorganisation in 1956, has always had high literacy rates similar to Kerala. The other districts with higher literacy rates than the State average include Nilgiris, Coimbatore, Tirunelveli, Thanjavur, Chengalpattu and Madurai. The backward district of Dharmapuri has the lowest literacy rate (29%). Salem, South Arcot and Pudukkottai also have relatively low literacy rates (Exhibit 5.5).

EXHIBIT 5.5

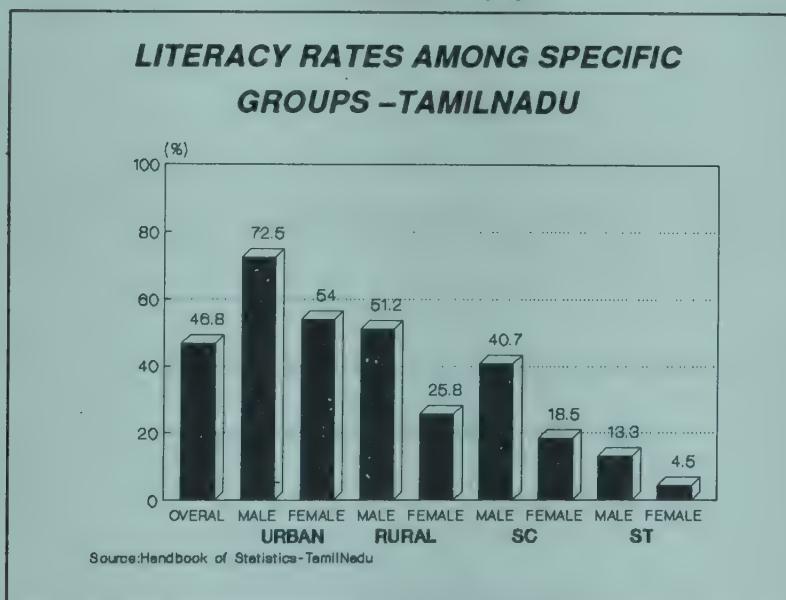
TAMILNADU PERCENTAGE OF LITERATES AMONG THE POPULATION 1961



LITERACY RATES AMONG SPECIFIC GROUPS

5.11 There exists wide variations in literacy rates between urban and rural areas, males and females and Scheduled Castes and Scheduled Tribes vis-a-vis the general population as indicated in Exhibit 5.6

EXHIBIT 5.6



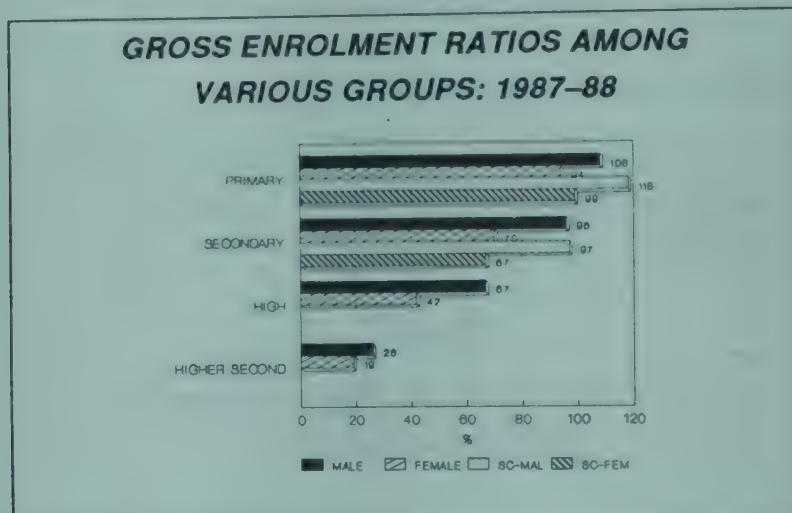
The above exhibit indicates that the literacy situation of rural women in general and the women of backward classes in particular is very poor. The Government of Tamil Nadu also recognises this and has undertaken special programs to improve literacy and education among women and backward classes in the State. The Government is stressing on high

levels of primary enrolment for these groups and a number of incentive schemes are offered to increase their retention in higher classes. These include:

- (1) Special scholarships and other benefits to Adi-Dravidar, Scheduled tribe and backward class students.
- (2) Special studies in English, mathematics and science in the evening every day for high school students of these communities. This scheme benefits 67,000 students in 100 selected schools.
- (3) A marriage grant of Rs. 5000 for all girls from poor households completing 8th standard.
- (4) Foster parent scheme where poor parents are paid an annual grant of Rs. 250/- for sending their girl child to the school. This scheme benefits 50,000 girls in the State.
- (5) Provision for female teachers in all primary schools (at least for Standard I & II) to encourage higher enrolment for girls.

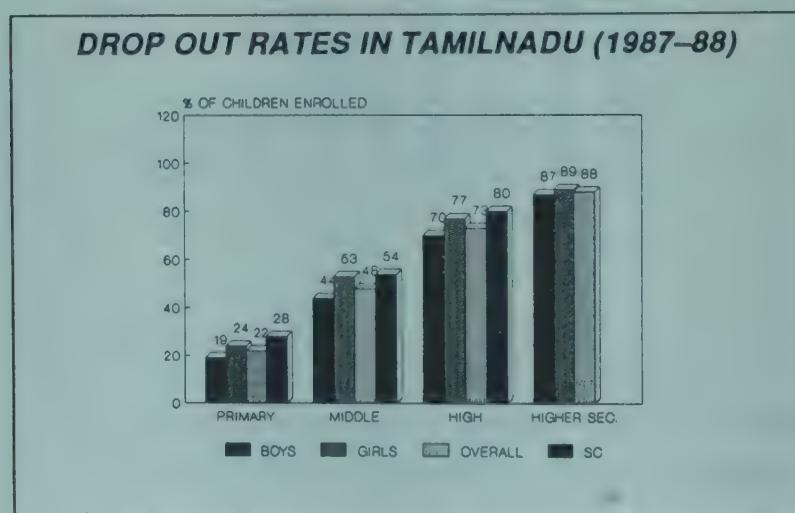
However, inspite of these efforts the enrolment ratio for girls remains low (Exhibit 5.7) coupled with high drop out rates as evident from Exhibit 5.8. The reasons for this are many:

EXHIBIT 5.7



- (1) Most parents are not willing to spend any money towards the education of a girl child.

EXHIBIT 5.8



DEFINITIONS

Gross Enrolment Ratio

Represent proportion of school age population that is actively under instruction.

Drop Out Rates

Represent the proportion of total children enrolled who discontinue education in subsequent stages.

- (2) Even when the education is free, most girls are required at home to help the mother in household chores or look after the younger siblings.
- (3) In some cases even when girls are sent to primary schools initially, social customs prevent them to attend male dominated schools once they reach the age of menarche.

Among the SC/ST population there has been a substantial increase in the enrolment ratio which is now nearly the same as that for the general population, though drop out rates continue to remain high. The high enrolment for these children has been achieved by putting a special emphasis on their education and later, on their employment, by the policy of job reservations. Still the drop out rates continue to remain high as economic compulsions force them to leave school and engage in remunerative occupations.

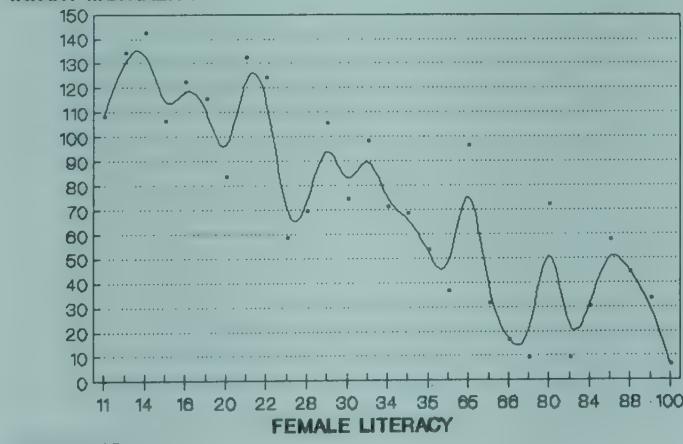
FEMALE LITERACY AND INFANT MORTALITY

5.12 Analysis of cross sectional data across regions indicates that there exists a strong correlation between the female literacy and infant mortality (see exhibit 5.9).

EXHIBIT 5.9

FEMALE LITERACY & INFANT MORTALITY IN SOUTH EAST ASIA-A CORRELATION

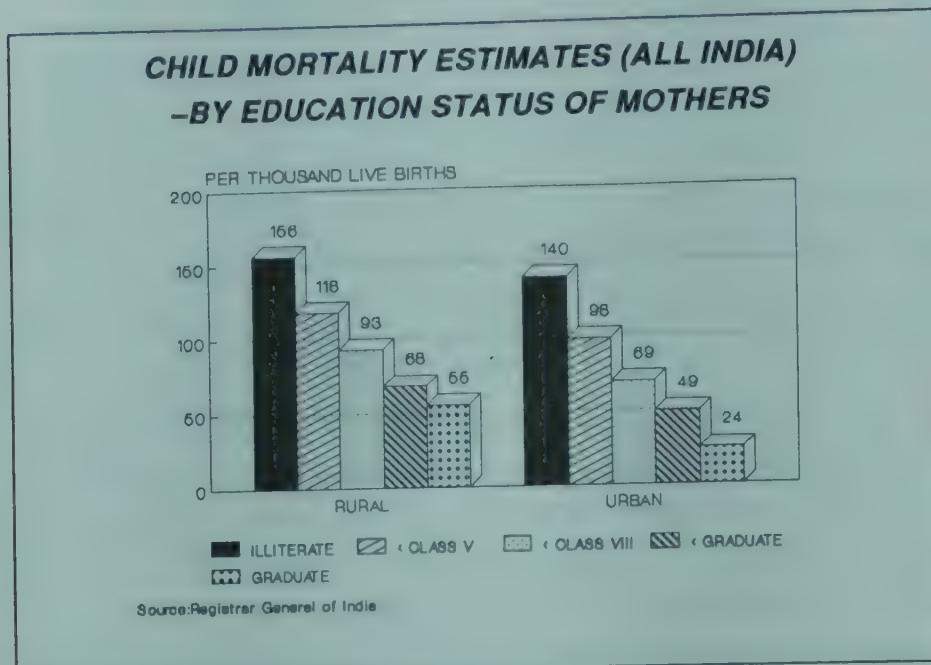
INFANT MORTALITY



Higher the female literacy percentage in a Country/State lower the infant mortality. Many micro-studies covering illiterate and literate mothers in urban and rural areas also indicate

that as the education level increased the child mortality (under five) declined (Exhibit 5.10). The role of female literacy in creating the social demand for primary education for children is also widely recognised. Thus female literacy can be a powerful tool for improving the health, nutrition and educational status of children.

EXHIBIT 5.10



5.13 It is in recognition of this fact that the State Government has undertaken a program of adult literacy through the non-formal education system, directed specially at women especially in rural areas and of backward classes. There are a number of programmes operating in the State since 1980, some sponsored by the Centre, others by the State and voluntary agencies (Table 5.1). Till date 61 lakh learners have benefited by these programmes of which 43 lakh are women. This constitutes close to 30% of illiterate population in the State and is a remarkable achievement. Currently 26,820 adult education centres are operating, benefiting 9.4 lakh learners of which 6.4 lakh are women.

LITERACY IN RURAL AREAS

5.14 The literacy rates in rural areas are substantially lower than those in the urban areas. This is a function partly of the reach of the education facilities and partly of the attitudes of the people. The general apprehension about the relevance of education arises from the fact that the education is not employment oriented resulting in a large number of educated unemployed youths in rural areas who are not suitable for any locally available jobs. The Government is putting in a lot of effort towards both extending the reach of education to rural masses as well as making education employment oriented through vocationalisation of higher secondary education. Exhibit 5.11 and Exhibit 5.12 which give the urban/rural distribution of school facilities indicate that at the primary level there are adequate facilities in rural areas though for higher education the facilities still seem to be lacking. As far as vocational training is concerned the State has made a significant headway with more than 1,267 institutions offering vocational courses at higher secondary level benefiting 95,000 students.

TABLE 5.1

ADULT EDUCATION PROGRAMMES IN TAMIL NADU

PROGRAMME	PERIOD	ANNUAL EXPENDITURE BY	SPONSORED PROJECTS	NO. OF CENTRES	TOTAL BENEFICIARIES DURING THE PERIOD*		
					M	W	T
1. Rural Functional Literacy Project	July 79 to Dec. 88	Rs.4 crores	Centre	27	8100	5.1	14.7
2. Janashikshan Nilayam (JSNs)	March 88 to Feb. 89	Rs. 0.6 Crores	Centre	27	850	— NIL —	19.8
3. State Adult Education Programme	1980.81 to Dec. 88		State	152	15200	9.1	22.4
4. Voluntary Agencies	1979-80 to Dec. 88		Private			1.3	4.0
5. Universities and Colleges	1979-80 to March 88		Private			0.8	0.8
6. Mass Programme of Functional Literacy	1986, 87, 88					0.7	0.8
7. Other Programmes:	includes Nehru Yuvak Kendra-NSS, Teacher's Training and Integrated Tribal Development Programmes					0.9	0.5
Total						17.7	43.4
							61.0
							28.3

* In lakhs

EXHIBIT 5.11

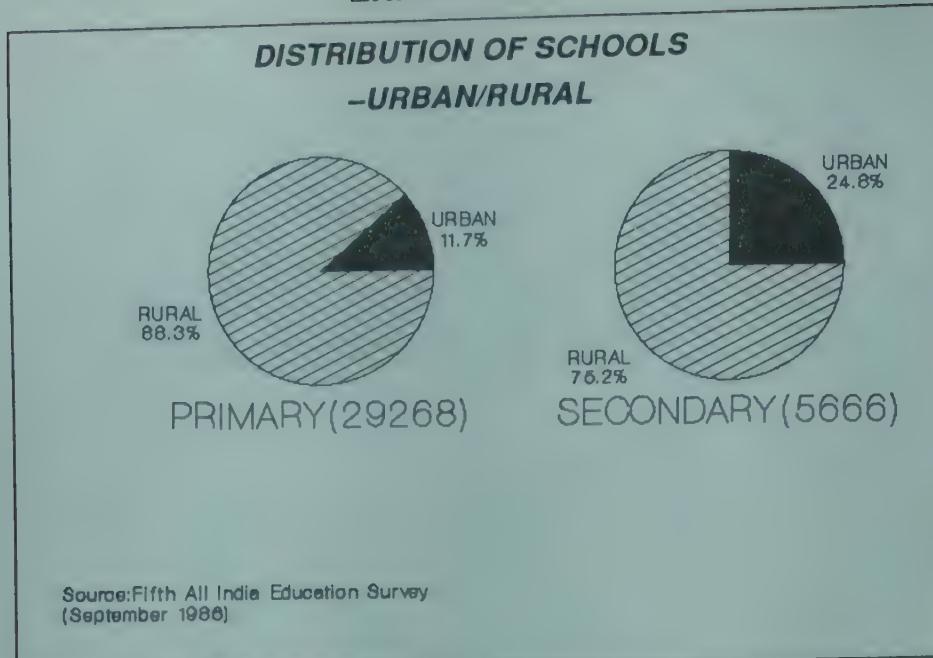
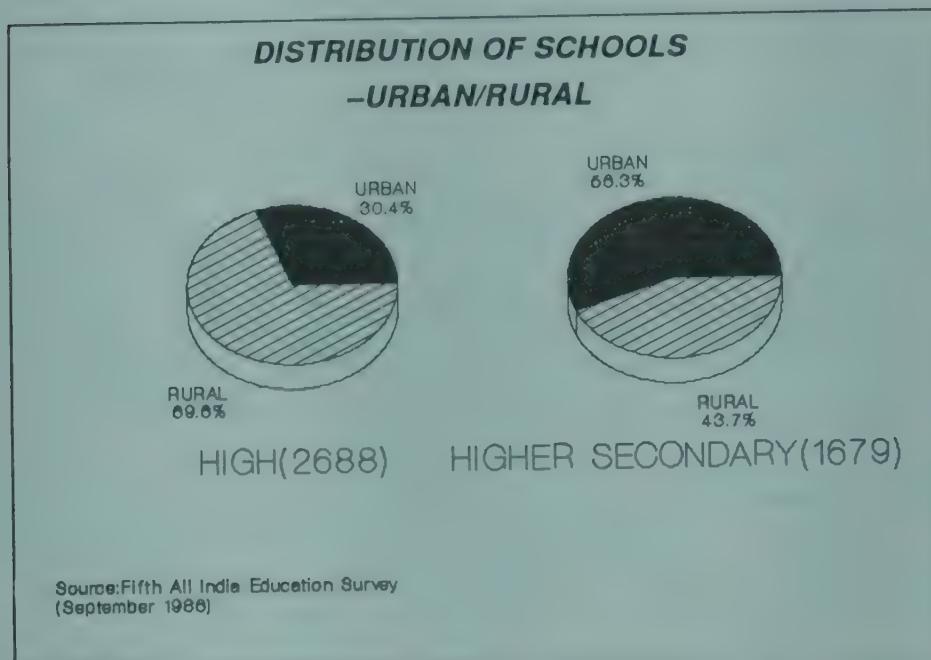


EXHIBIT 5.12



PRE-SCHOOL EDUCATION

5.15 The need for pre-school education is well recognised as it stimulates the mental ability of a child at an early age. The national Policy on Education (1986) recognises this and places high priority on Early Childhood Care and Education (ECCE). ECCE has been considered as a feeder and support programme for primary education. The programme has been integrated with other child development services like ICDS and TNGNMP. In fact during 1986-88, all the Child Welfare Centres operating under ICDS and TNGNMP were converted to Nursery schools. Children between the age of three and five attend the Nursery schools (ie. Child Welfare Centres) for three hours a day. The main function of the pre-school education is to stimulate and satisfy the curiosity of the child rather than follow any rigid curriculum. The children are also provided nutrition supplements and health services at the centre. Currently there are 23,483 and 4,840 nursery schools functioning in the rural and urban areas respectively benefiting 20.7 lakh children in the age group 2-5 years.

DAY CARE CENTRES

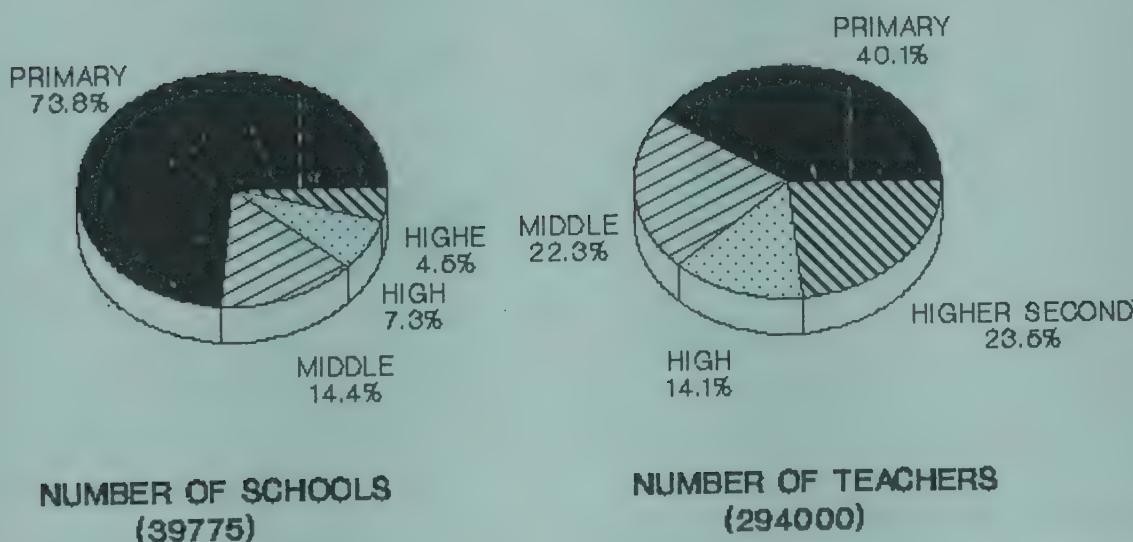
5.16 Further with the gradual dismantling of the joint family system and increasing participation of women in the work force there is a social need for providing day care centres where the young children of the working mothers can be looked after. This is of particular importance in Tamil Nadu where it is estimated that more than 50% of rural women and close to 18% of urban women attend work. The Government recognises this need and is promoting 'creches' (Day Care Centres) run by voluntary agencies. The State Social Welfare Board gives full grant for running these creches. Currently there are 862 such creches functioning in the State benefiting 21550 children.

PRIMARY EDUCATION

5.17 Primary education is free in Tamil Nadu for all students. At the secondary level, the education is free in schools where the medium of instruction is Tamil. The State follows the two language formula with emphasis on the regional language or the mother tongue and English or any other non-Indian language as the second language.

5.18 As on September 1988, there were 39,775 schools in the State, of which 74% were primary schools, 15% were middle schools, 7% were high school and the balance 4% were higher secondary schools. In terms of number of teachers the composition was slightly different. There were 2,94,340 teachers of which 40% were in primary schools, 23% in middle schools, 13% in high schools and 24% in higher secondary schools. (Exhibit 5.13)

EXHIBIT 5.13
SCHOOL EDUCATION SYSTEM IN
TAMILNADU

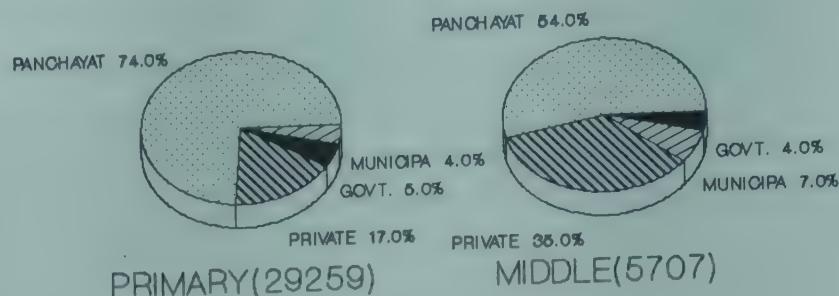


SCHOOLS BY MANAGEMENT

5.19 Exhibit 5.14 clearly indicates that at the primary and middle school level, panchayat union schools are predominant.

EXHIBIT 5.14

CLASSIFICATION OF SCHOOLS BY MANAGEMENT



with 74% and 54% of schools falling in this category. Against this the Government and municipal/corporation managed schools account for only 9% and 11% of schools respectively at primary and middle school levels. At secondary school level (Exhibit 5.15) these constitute 65% and 48% of high and higher secondary schools respectively. Privately managed schools account for 17% of primary schools, 35% of middle schools, 35% of high schools and 52% of higher secondary schools. Many of these are Anglo-Indian schools run by Christian missionaries.

EXHIBIT 5.15

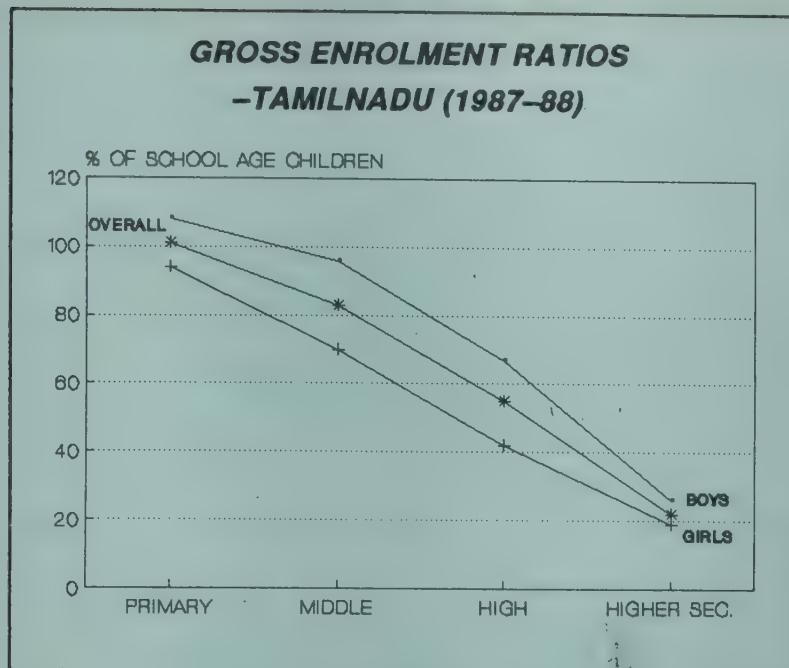
CLASSIFICATION OF SCHOOLS BY MANAGEMENT



EDUCATION ENROLMENT

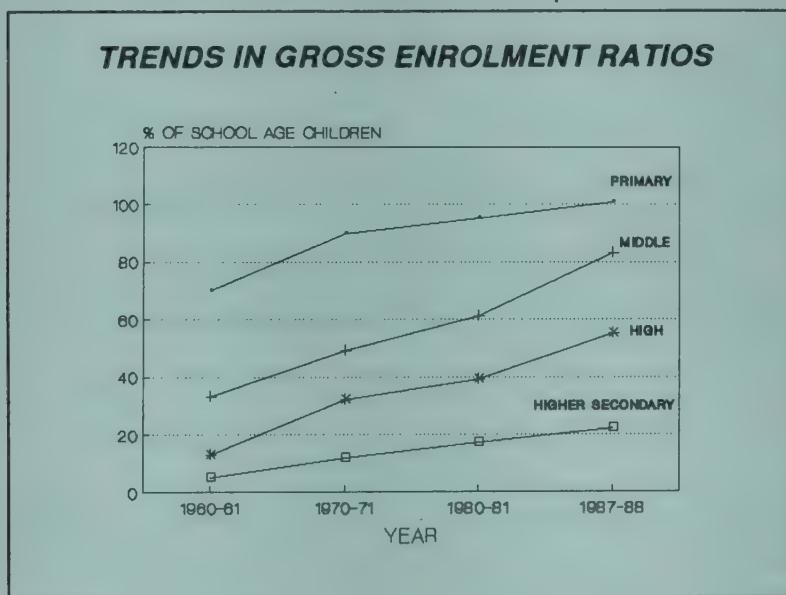
5.20 An important indicator of the education status of the children in the State is the enrolment ratio which represents the proportion of the school age population which is actively under instruction. According to the data compiled by the Education Department of the State Government the enrolment ratio at primary level is 101%, which gradually declines to 86% at middle school level, 56% at high school level and 24% at higher secondary level (Exhibit 5.16). As discussed earlier there are wide differences between the enrolment

EXHIBIT 5.16



ratios of boys and girls, specially at the higher levels. This indicates that though there has been an emphasis on education of girls, the enrolment ratios remain lower indicating the continuing discrimination against the girl child. The enrolment ratios in recent years have increased considerably over 1980-81 level when the enrolment ratios were 95%, 61%, 40% and 17% at primary, middle, high and higher secondary level respectively, as evident from Exhibit 5.17. The increase has been greater at middle and high school level while at higher secondary level the gross enrolment ratio has remained more or less stagnant.

EXHIBIT 5.17

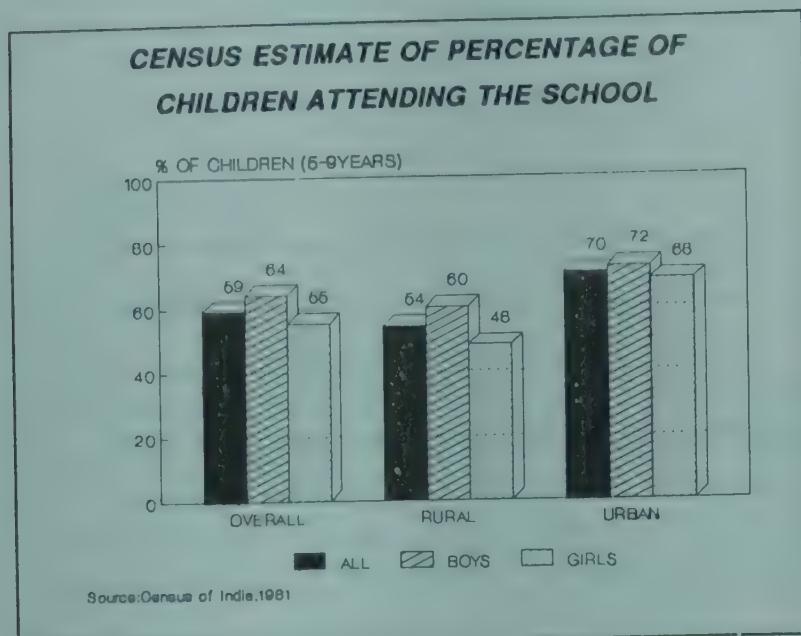


5.21 The universal enrolment at the primary level has to be interpreted with caution in a system where there are a large number of over age and under age children in a particular grade. The universal enrolment in that situation does not indicate full coverage of all the eligible children by the system.

5.22 The 1981 Census data provides data on percentage of children attending school. This

provides a good cross check for school enrolment achievements. Exhibit 5.18 which provides this data indicates that the coverage of children under the education system is 60% in the age group 5-9 years and 55% in the age group 10-14 years. The coverage is lower for girls than boys and in rural areas than urban areas.

EXHIBIT 5.18



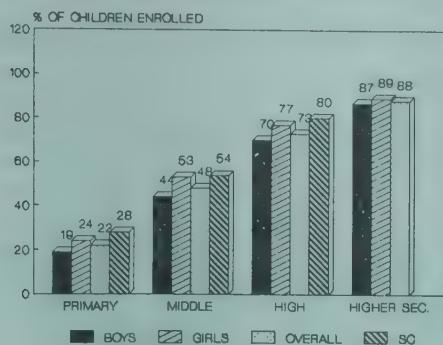
5.23 Near universal enrolment at primary level has been achieved by expanding education facilities to reach the vast population of rural children and by motivating first generation learners through enrolment drives. In fact almost 46% population in the State has access to a primary school within the distance of 1 km. Primary school teachers have targets for enrolment and they visit rural households to persuade parents to send their children to school. In recent years incentive schemes like noon meal schemes have been launched where a nutritious meal is provided to all school going children. This has proved to be a tremendous incentive for the child to attend school and has increased school enrolment and reduced drop-outs.

DROP OUT RATES

5.24 Though the State has been successful in achieving 100 percent enrolment (of boys, atleast) at primary level, the drop out ratio remains high leading to wastages. It is due to this wastage that the high enrolment at primary stage has not been able to make any significant contribution towards achieving higher literacy levels. Exhibit 5.19 which gives the drop out rates at various levels indicates that by the end of middle school level, only 52% children are retained in the education system. The percentage is even smaller at 27% and 12% respectively at high and higher secondary level. The drop out rates are higher among girls than boys specially at the end of middle school level. Among the scheduled caste population too the drop out rates are significantly higher than the general population.

EXHIBIT 5.19

DROP OUT RATES IN TAMIL NADU (1987-88)



5.25 The reasons for high drop outs are many

- (1) Though education is free at all levels, the opportunity cost of sending the child (specially older children) to school remains high as they can be gainfully employed at home or on fields.
- (2) The parents do not perceive the education to be of any relevance as they see many educated unemployed youths unable to get suitable jobs.
- (3) Lack of vocationalisation of education aimed at developing skills which can be used subsequently to generate direct employment.
- (4) The quality of education remains poor and it fails to arouse the child's interest in learning.

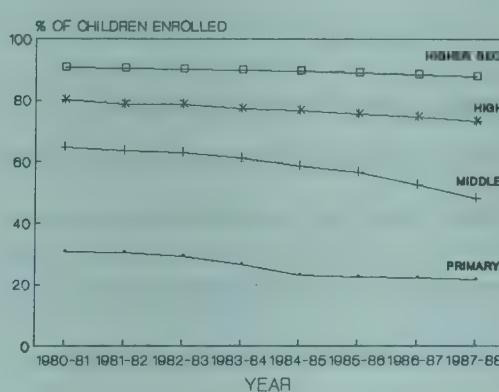
Thus there is an urgent need to increase the retention in schools by providing incentives for the child to attend school and by improving the quality and relevance of education. Vocational training at high/higher secondary level could go a long way in making education employment-oriented. The appropriateness of an education subsidy to parents for sending their child to school remains debatable but it could go a long way in improving school enrolment and attendance.

5.26 The Government of Tamil Nadu recognises this and has launched a number of schemes in recent years to achieve higher retention rates. These include:

- (1) Providing mid-day meal to 64 lakh pupils (1988-89 estimates) in standard 1-10. The children in standard 1-5 are fed all the 365 days while children in standard 6-10 are fed on school working days. This scheme is a tremendous incentive for children to attend school regularly and it has been observed that drop out ratios have reduced since 1982 when the scheme was first implemented. However, no evaluation has been made to assess and quantify the impact of this scheme on school enrolment and retention (Exhibit 5.20).

EXHIBIT 5.20

TRENDS IN DROP OUT RATES



- (2) Providing free text books and school uniforms to pupils in standard 1-8. This scheme benefits 62.1 lakh children, by way of reducing their cost of education.
- (3) Providing an annual grant of Rs.250/- to poor parents for sending the girl child to school. This scheme currently benefits 50,000 girls annually. Further, poor girls completing Class VIII are also given a marriage grant of Rs. 5,000/-.

NON-FORMAL EDUCATION

5.27 The scheme for non-formal education for school drop-outs and non-starters in the age group 6-14 years, was introduced in Tamil Nadu in 1977. The scheme covered 374 blocks with 2 centres in each block and 30 children per centre. These children attended a three year curriculum and at the end of the third year, could sit for 8th standard public examination. The classes were conducted for 2 hours a day in the evenings by the primary school teacher who followed a flexible curriculum to suit the needs of children. The programme benefited 22,500 children and was extensive in its coverage but had to be stopped in 1980 due to lack of funds.

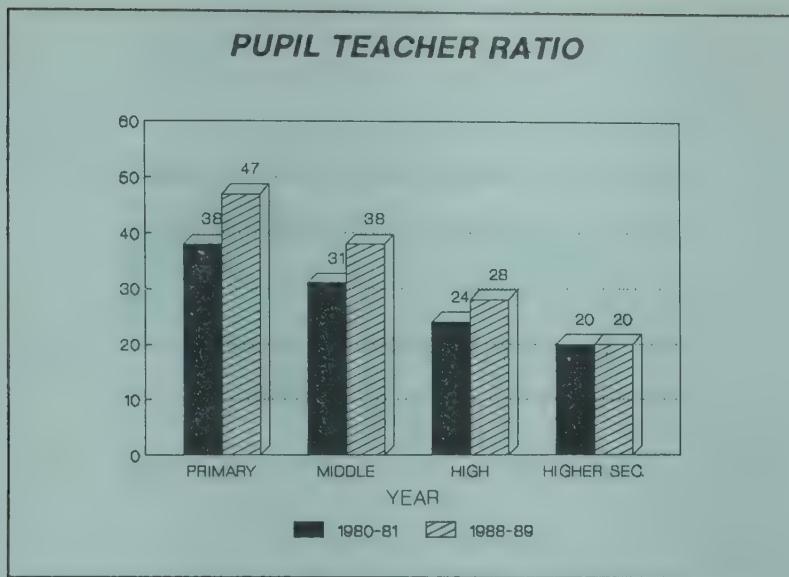
5.28 In 1978, the system of non-formal education was extended to children working in the match industry in Sivakasi. A total of 100 centres were opened benefiting 2000 working children. This programme too had to be stopped in 1981 as it came in direct conflict with the provisions of the Factories Act, which specifies that children below 14 years should not be employed in Match Factories. The children who worked in these factories were not supposed to be under 14 years and, therefore, were not covered by the non-formal education programmes.

5.29 However, since 1986-87, the scheme of non-formal education for children has been revived and is being viewed as one of the primary tools towards achieving universal education and higher literacy. Two projects have been set up (in Madras and Sivakasi) with 100 centres each. Each centre enrols 25 students of which close to 20 are girls. The programme follows the NCERT (Hapur Committee) syllabus for non-formal education. The course is for 3 years with the third year curriculum equivalent to 5th standard of elementary school system. The projects are financed with 80% Central and 20% State funds. While the Madras project has been successful with full enrolment and reasonable attendance, at Sivakasi, the State government's programme of non-formal education overlaps with that functioning under the National Child Labour Programme, resulting in poor attendance at the State run centres.

QUALITY OF EDUCATION

5.30 The two important quantitative indicators for assessing the quality of education are pupil-teacher ratio and percentage of trained teachers to total teachers. Exhibit 5.21 which gives the pupil-teacher ratio in the State in 1980-81 and 1988-89 indicates that the ratio has come down marginally in recent years, specially at the primary and middle school level and is well above the recommended norm of 40 and 30 respectively. The deterioration in pupil teacher ratio is due to rapid increase in enrolment during recent years which was not matched by corresponding increase in number of teachers. Further, there are wide variations between schools indicating that situation could be appalling in some schools. In terms of trained teachers as percentage to total, Tamil Nadu is better off at almost 100% at all levels, against the average of 87-90% for All India.

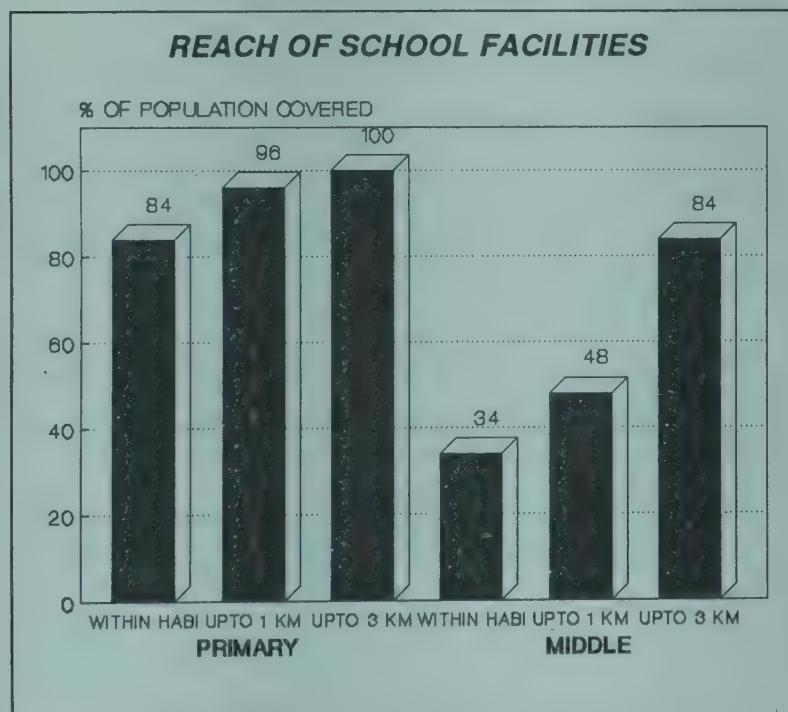
EXHIBIT 5.21



REACH OF THE EDUCATION SYSTEM

5.31 The Fifth All India Education Survey conducted in September 1986 which examines the reach of the education system suggests that the spread of primary school facilities has been wide and more than 96% of population has access to a primary school within 1 km distance. At the middle school level, the coverage is not adequate with only 48 percent of population having the access within 1 km distance and only 84 percent of population having access within 3 km range (Exhibit 5.22).

EXHIBIT 5.22

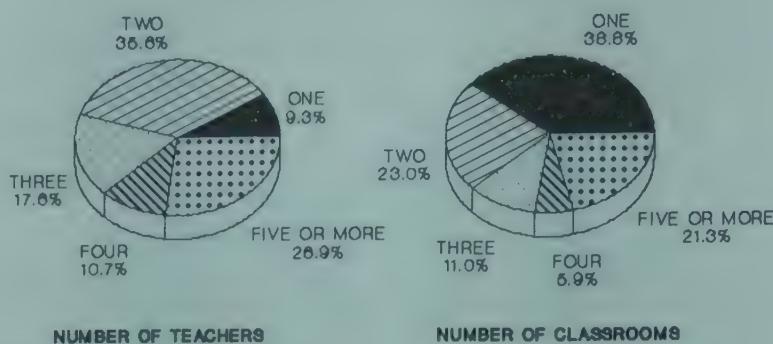


QUALITY AND ADEQUACY OF SCHOOL FACILITIES

5.32 Even though the coverage of the school system is impressive, it is widely known that the resources have been spread too thin and the facilities remain inadequate and poor. Exhibit 5.23 shows that only 27 percent of primary schools have adequate teachers (five or more) and the percentage is even lower at 21 percent in terms of adequacy of class rooms.

EXHIBIT 5.23

CLASSIFICATION OF PRIMARY SCHOOLS -BY ADEQUACY OF BASIC FACILITIES



Source: Fifth All India Education Survey
(September, 1986)

QUALITY OF FACILITIES

5.33 In terms of availability of basic facilities in schools like pucca building, playground, blackboard, furniture, drinking water facility, urinals and lavatories, though Tamil Nadu is better off than the rest of the country (Table 5.2), these by and large remain inadequate. Realising this, the Central Government has introduced the 'Operation Black Board' scheme since 1987-88. It aims to bring about substantial improvement in facilities for primary education by 1989-90 through:

- (1) Provision of adequate accommodation for primary schools.
- (2) Conversion of single teacher schools to double teacher schools.
- (3) Provision of essential teaching and learning material to all primary schools.

In Tamil Nadu there has been a good progress under this scheme and more than 60% of schools have already been covered under the scheme. A total outlay of Rs.12 crores has been sanctioned for Tamil Nadu under this scheme.

TABLE 5.2

	BASIC FACILITIES IN SCHOOLS			
	TAMIL NADU		ALL INDIA	
	PRIMARY	MIDDLE	PRIMARY	MIDDLE
Number of schools	29268	5666	529392	138687
Percentage of schools with				
Pucca building	79	78	57	69
Playground	87	92	58	74
Playground in useable condition	61	64	35	46
Blackboard	89	NA	80	NA

TABLE 5.2 (Contd.)

	TAMIL NADU		ALL INDIA	
	PRIMARY	MIDDLE	PRIMARY	MIDDLE
Adequate mats/ furniture	40	NA	29	NA
Drinking water facility	85	86	47	67
Urinals	29	54	15	41
Separate urinals for girls	1	32	5	22
Lavatory	11	32	6	20
Separate lavatory for girls	7	30	3	11

Source: Fifth All India Education Survey - September 1986

6. Child Labour

6.1 Child labour has assumed serious proportions in developing societies as economic compulsions force children to participate in work. According to an estimate by the International Labour Organisation (ILO), a third of Asia's 38 million working children belong to India. Within India, Tamil Nadu account for the maximum number of children engaged in the labour force followed by Assam.

LEGISLATIVE ASPECTS

6.2 In the past Government policy towards child labour has wavered between the intention to ban it and the desire to regulate it. Some of the earlier acts like Factories Act, 1948, Mines Act, 1952, Plantations Labour Act, 1951 etc. laid down the minimum age for employment of children (varies between 12-16 years) in some sectors and regulated their hours of work. However, these acts had limited coverage and applied only to large and organised sector units, while it is the unorganised sector which is the largest employer of child labour in the country. Further, enforcement of these laws remains poor.

6.3 In recent years, the concept of regulation of child labour by a comprehensive legislation has found greater acceptance. The high power committee (Gurupadaswamy Committee) constituted by the Government of India (1979) has held that in the present socio-economic conditions of the country, a ban on employment of children is not possible. However, employment of children in hazardous occupations should be banned and their working conditions should be regulated. Thus, Child Labour (Prohibition and Regulation) Act, 1986 prohibits working of children below 14 years in hazardous industries such as beedi-making, manufacture of matches, explosives and fireworks, carpet weaving, printing, dyeing and weaving and cement manufacturing. It also prohibits working of children in more than one shift or engaging them in night shift.

6.4 It is clear that the legislation has been drafted on the premise that since the root cause of child labour—poverty, cannot be eliminated overnight, the best solution is to regulate the practice of child labour. Accordingly, employment of children above 12 years has been allowed in selected areas of the organised sector, with suitable safeguards against exploitation and provision for educational and recreational facilities. Apart from stipulating the minimum wages, weekly rest days and hygienic working conditions, the Act also takes care of the health need of child workers. The ratification of the ILO convention of 1973, abolishing labour by children remains a distant dream for India.

CAUSES OF CHILD LABOUR

6.5 The causes of child labour are many:

- (1) Poverty is the primary reason why children work as their income is essential to supplement the meagre income of their families.
- (2) Employers' preference for children as they are cheaper, unorganised and more flexible.
- (3) Parental perception of several advantages in the child taking up a job early, in view of widespread unemployment among educated youth.

NATURE OF CHILD LABOUR

6.6 It is difficult to quantify child labour as both 'child' and 'labour' are not well defined in the context of child labour. Children work in many different work situations which include:-

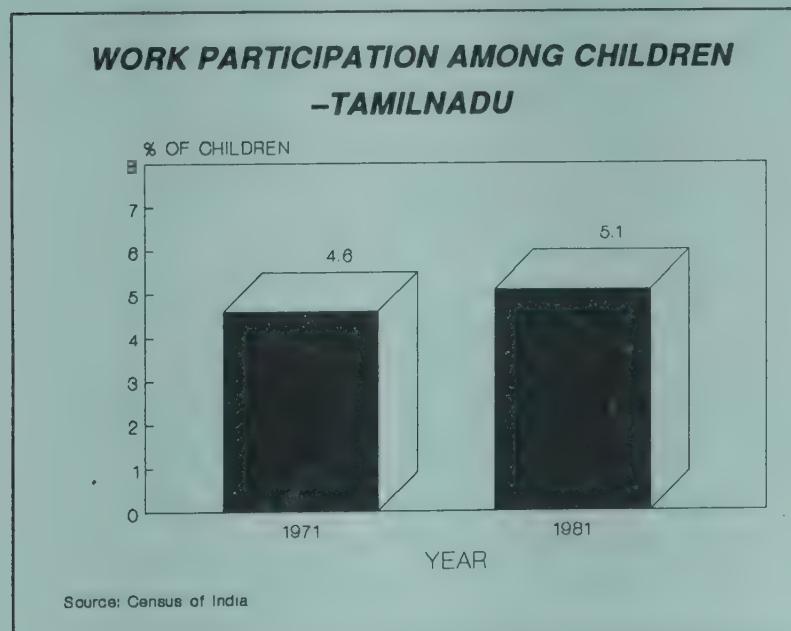
- (1) Children engaged in domestic work: Non-productive, unpaid work for maintenance of the household, allowing their parents to go out and work as wage labourers. Many young girls are engaged in this kind of work.
- (2) Non-domestic, non-monetary work performed within the household settings: includes children's participation in agriculture and a variety of cottage industries including dairy and handloom.
- (3) Wage labour: This includes employment in both, organised (match factories) and un-organised sector (auto workshops, restaurants, tea shops, domestic help etc.)
- (4) Bonded labour: Rural indebtedness and acute poverty is the major cause of bonded child labour in rural agriculture and urban unorganised sector. Some examples include bonded labour in the beedi industry in Vellore and the fireworks industry in Sivakasi.

6.7 According to Census estimate more than 80% of working children are in the rural areas and are engaged in the second category of work which is non-monetary. Further, a large number of children in both rural and urban areas work in the informal unorganised sector which includes small workshops, restaurants and cottage and small industries. This sector is unregulated and this makes it difficult to obtain an exact estimate of working children and facilitates their exploitation and abuse.

MAGNITUDE OF THE PROBLEM

6.8 The Census estimate provides some indication of working children in the State, though there are likely to be underestimates. The 1981 Census estimated the population of working children in the State at 0.87 million which represents 5% of children (0-14 years) in the State. When compared with the earlier Census data, this represents an increasing trend (Exhibit 6.1).

EXHIBIT 6.1

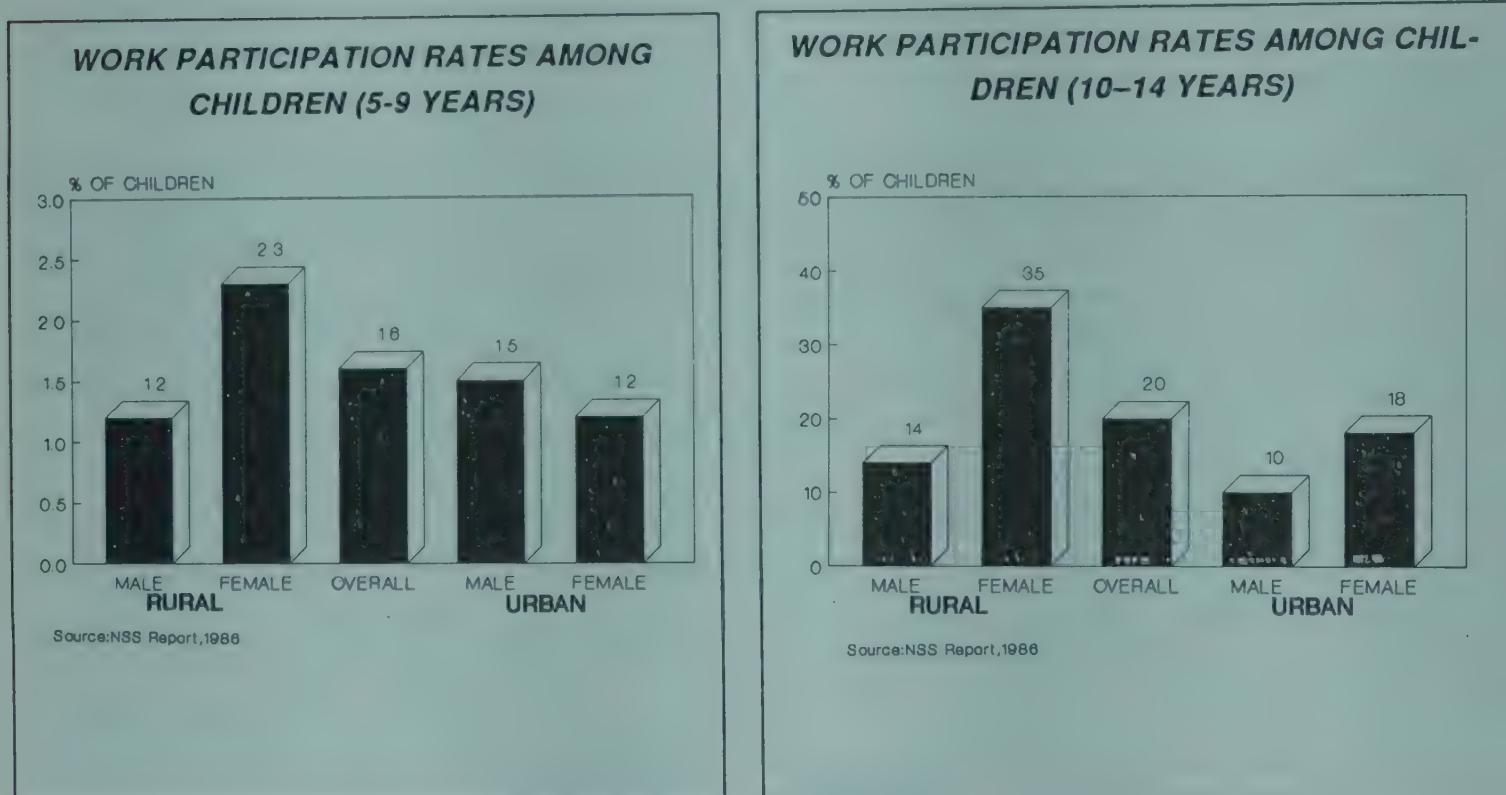


6.9 N.S.S.O conducted surveys on employment and unemployment in 1978 and 1986. According to the 1978 survey, close to 19% of children in the age group 5-14 years are working in Tamil Nadu. However, the 1986 survey indicates that 1.6% of children in the age group 5-9 years and 20% of children in the age group 10-14 years in the State are working. These estimates are higher than the Census estimate as they include children working in non-productive, household work (which is not included in the Census estimates).

6.10 Operations Research Group, Baroda, conducted an All India Child Labour Survey in 1980-81. The survey estimated that there are more than 44 million working children in India as against the Census estimate of 13.5 million in 1981. In Tamil Nadu, a survey done by Sacred Hearts College, Tirupattur revealed that more than 17% of children in Tirupattur in the age group 6-14 years are working. Tirupattur is a small town with a population less than 60,000. Therefore it appears that the actual number of working children in the State is likely to be higher than even the NSSO estimates.

6.11 From the NSSO data it is evident that the work participation rates of children are far higher in rural areas than in urban areas (Exhibit 6.2) and higher among girls than boys. These rates show negative correlation to school attendance of children..

EXHIBIT 6.2



6.12 In fact it is well recognised now that the practice of child labour is one of the major obstacles in the universal acceptance of school education. Most poor parents cannot afford to send their children to school, even when the education is free, due to opportunity cost of foregone labour. Thus, school drop out rates continue to remain high (50% in the age group 10-12 years and 70% in the age group 13-14 years) and child labour persists.

SECTORS IN WHICH CHILDREN WORK

6.13 In Tamil Nadu children are engaged in a variety of sectors like

- (1) Agriculture
- (2) Match and Fireworks industry
- (3) Beedi industry
- (4) Handloom
- (5) Hosiery
- (6) Rag picking
- (7) Auto workshops, petrol pumps
- (8) Hotels, restaurants, canteens, tea stalls
- (9) Hawking and vending and
- (10) Households (domestic help).

6.14 In fact Tamil Nadu accounts for a large proportion of children employed in the organised sector. It is a well known fact that a very large number of children work in the match and fireworks industry, beedi industry and hosiery industry in TamilNadu. Children constitute as large as 10-14% of labour force employed in these sectors. This is in spite of the Factories Act as well as the Employment of Childrens' Act which ban the employment of children below 14 years in factories and these industries.

6.15 The problem of child labour, their conditions of work and living and their exploitation varies from sector to sector. Hence, the following sections describe their conditions of work and problems in each of these sectors:

AGRICULTURE

6.16 The first and second Agricultural Labour Enquiry revealed that in agriculture, children are given jobs suited to their age such as tending crops, gathering fuel, selling vegetables, looking after cattle etc. Children usually attend to this work during their spare time but during the busy agricultural seasons (October to January) they are called upon to work full time. Thus, many rural children drop out of school during these months. Academically too these are busy months (pre-examination) and a child who drops out during these months finds it difficult to continue studies. In fact for a long time, it has been recognised that there is a need to change the academic year in India to suit the agricultural season.

6.17 The Bonded labour system is rampant in the agricultural sector in the State. Children are pledged to the employer against a loan and they have to work for them till they can repay the loan. This amount is seldom cleared because of usurious rates of interest which keep inflating the amount. Thus, most often, a child once bonded remains bonded till he is able to buy freedom by giving his own offspring in bondage. Thus many children enter bondage at a young age of 5-7 years. Bonded labour is prevalent in many parts of Tamil Nadu including Ramanathapuram and Dharmapuri. The rural indebtedness and abject poverty are the primary causes of bonded labour system in Tamil Nadu.

MATCH AND FIRE WORKS INDUSTRY

6.18 It is estimated that there are 25,000 children (<14 years) working in the entire 'match' belt

including Sivakasi, Srivilliputtur and Sattur in Kamarajar and Kovilpatti in Tirunelveli districts. (A Report by Centre for Social Research -1984). This match belt produces more than 0.14 billion match boxes a year, accounting for more than 70% of country's production. In fireworks, Sivakasi and adjoining centres have a virtual monopoly with 95% of the country's demand being met by them.

6.19 The entire district of Kamarajar is located in a region with scanty rainfall and is drought prone. The dry climate of the region is ideally suited for match and fireworks industry. Further, the poor performance of agriculture and rampant poverty ensure availability of cheap labour. Thus, hand-made match and fireworks industry has flourished in this area.

CONDITIONS OF WORK

6.20 Children (below 14 years) constitute more than 45% of labour force in this industry. This is in spite of the provisions of Factories Act which prohibit employment of children in this industry. Most of these children are in the age group 7-14 years and come from neighbouring villages. It was found in a study that the match industry employed twice as many girl children when compared to male children. They are brought to work by the company bus between 6-7 a.m. and continue to work till late evening. Majority of children are employed in frame filling (68%) and box filling (18%) operations (Source: A survey on child labour in Sivakasi by Centre for Social Research). The children come in contact with hazardous chemicals either directly or indirectly throughout the day. In fact it is estimated that 6% of children in the industry are engaged in the highly hazardous operation of chemical dipping which generates smoke which is injurious to the respiratory system of the child. At times there are explosions or fire out breaks on the premises taking a significant death toll.

6.21 Children are paid on a piece rate system which forces them to work at a frantic pace all day long. Inspite of this they earn meagre salaries. A survey of 800 children in Sivakasi area revealed that 80% of children earn less than Rs.100 per month, with the majority averaging around Rs.50-80 per month. Besides long hours of work, children have to commute to work and back (at times 15-20 kms). Thus many children leave their house before dawn (between 4.30 and 6 a.m.) and return only at night (around 8 p.m.).

6.22 The majority of these children are illiterate (52%). Few have completed primary level education (33%). They eat a very poor diet (45% of children surveyed indicated that they eat only rice for all 3 meals). These children do not have any spare time for personal hygiene, non-formal education or recreation.

6.23 The work environment is also very bad. Sheds are dark and dingy and are overcrowded. Basic facilities like drinking water, latrines etc. are not available. Inspite of hazardous nature of chemicals and accident prone environment, no safety measures are followed. There are no facilities for medical checkups or even first aid. In fact during June-September, pre-Diwali months when orders begin to pour in, even the basic safety standards are ignored and children are made to work beyond a point of exhaustion. In these circumstances mishaps occur frequently causing injuries and death.

6.24 It is learnt that these children consume a very poor diet and the "Noon Meals Scheme" does not reach them. They bring gruel/porridge of ragi flour or cooked rice and water and subsist on this for the whole day.

A CASE STUDY

7 year old-Meena was employed in a medium sized match factory situated in Sivakasi. She was suffering from malnutrition, looked unhealthy and was vulnerable to fever and other communicable diseases. The income brought by her father was inadequate for the family. One day Meena was suffering from an attack of viral fever. On that fatal day, Meena as usual went to the factory without eating any food in the morning. When it was nearing mid-day Meena was thirsty and exhausted. She repeatedly asked the supervisor in the shop-floor for drinking water. She was refused permission to go out and drink water, nor was water brought to her by any one. By noon Meena's tired limbs stopped working, she collapsed and died with her head on the frame.

No compensation was paid to her parents. The case went unreported.

BEEDI INDUSTRY

6.25 The beedi industry occupies a very important place in view of its large employment potential (second only to agriculture). It is mainly a cottage and home industry and is spread almost throughout the country. In Tamil Nadu, Tiruchirapalli, Tirunelveli and Vellore in North Arcot are some of the major centres. The industry is mostly carried on in three distinct forms viz.

- (1) Factory system
- (2) Contract system and
- (3) Gharkhata or house worker system.

6.26 Children and women workers are predominantly engaged in the Gharkhata system. Under this system, workers take tobacco and beedi leaves home and cut and roll beedis at their residence.

6.27 A survey of beedi making units in Tiruchirapalli and Tirunelveli indicates that children constitute 20-30% of the total labour force in this industry (estimated at 40 lakh on All India basis). These children are paid wages on piece-rate system. The wages remain low at Rs.5.50 per 1000 beedis.

6.28 Exploitation is rampant both under the Factory and Gharkhata system. In beedi factories in Vellore, unscrupulous manufacturers force children to work 10-12 hours a day for a pittance. There is no question of leave, sickness benefit, bonus etc. Their work is not regular. The work depends on the supply of raw materials and employer/contractor may refuse to give them work on any particular day of the week. In the beedi industry in Vellore, children are even mortgaged to employers against loan.

6.29 Under the Gharkhata system, workers are exploited by contractors in a number of ways. While giving raw materials, contractors wet the tobacco which weighs more. Thus while

rolling beedis, workers find themselves running short of tobacco and have to purchase it from the market to supplement the short supply. Further 10 percent is usually deducted for defective beedis.

6.30 Children in the beedi industry face a high incidence of bronchitis and face the danger of suffering from Tuberculosis at a later date. This is due to starting work at a tender age, very long hours of work, excessive overcrowding and peculiar posture during work which is an impediment to the healthy development of the lungs of the children.

6.31 Although Government has tried to bring the informal and unorganised Gharkhata system of production under legislative framework from time to time, through special legal enactments like Beedi and Cigar workers' Act, 1966 and Beedi Workers Cess and Fund Act, 1976, each time the industry discovers means of circumventing the regulation. Earlier in response to the 1966 enactment, the contractor system came into force, giving employers a way out of all statutory obligations such as provident fund, bonus etc. After the 1976 enactment which made it mandatory for manufacturers to issue identity cards to all workers so that they could utilise gratuity and provident fund provisions of the law, the sale purchase system was invented where on paper, the employer-employee relationship was converted to a buyer-seller relationship.

HANDLOOMS

6.32 The handloom industry is one of the largest cottage industries and occupies a prominent place in the economy of Tamil Nadu. It is mostly a household enterprise in which children learn the craft at an early age and in the process assist parents/ relatives in the production work. Increasingly a system of Master weaver who engages weavers and helpers on a piece rate/daily wage basis is evolving.

6.33 In Tamil Nadu, Kanchipuram in Chingleput district and Chinnalampatti in Madurai district are the major centres. A survey done at these places revealed that children constituted close to 30 percent of labour force working in this industry (Source: Children of Darkness). These children were between the age group 7-14 years. Most of them never attended school and worked either in the family set up or with the master weaver. No minimum wages have been fixed for children working in this industry. Children who are engaged in winding spindles, sizing etc. earn Rs. 2-3 per day. Helpers earn even less. Children who attend to weaving, are paid on a piece rate basis and earn upto Rs. 10-15 per day depending upon the quality of the product.

HOSIERY

6.34 It is learnt that the hosiery industry in Tiruppur employs around 8,000 children between the age of 10 to 14 years, in its 2,000 knitting factories. These children constitute nearly 20-30 per cent of the work force employed in this industry. Tiruppur is located in a semi-arid taluk with scanty rainfall and dwindling ground water resources. However, the phenomenal growth of the hosiery industry during the last three decades has provided employment to 15,000 workers in the region.

6.35 A hosiery unit is a mechanised knitting unit, including a tailor shop. It requires a very low investment of Rs.20,000-50,000. Thus, a lot of farmers in the area have set up hosiery units. Tiruppur is also a haven for school drop-outs in the rural hinterland. Instead of asking their

children to take the cattle out for grazing, rural poor, living below the poverty line, send them to Tiruppur to earn good wages.

CHILD LABOUR—A REALITY

Factory owners in Tiruppur say they know child labour is illegal but they have to employ children as

- (1) Children are really dextrous and employers need them
- (2) Child labour gives them an edge over the other processing centres in terms of lower production costs
- (3) These children come from surrounding drought hit villages and need the job.

The phenomenon of child labour has led to an increase in school drop out rates in Tiruppur and surrounding villages. Family planning is also unheard of as every child adds to the total income of the family. Jobs in Tiruppur are easily available as the industry is thriving.

6.36 Children are employed in tailoring shops as helpers to tailors or cutters and for small jobs like buttoning, packing etc. They are paid on a piece rate basis and since most of these units depend on export orders, there is a tendency to work double shift or even 21 hours a day to meet delivery schedules. Most of the children are employed either on a temporary or casual basis. The factory premises are seldom cleaned with the result that there is a lot of cotton dust floating in the air, giving rise to respiratory problems, particularly among the children.

RAG-PICKING

6.37 27,000 children (<14 years) in Madras city alone are engaged in rag picking (Source: An estimate by Don Bosco Anbu Illam). These children with their soiled sacks on their shoulders, comb the city streets gathering bits of paper, plastic, rags, metals, anything at all that can be sold. Most children collect rags on their own and sell them directly to the concerned dealers. This phenomenon of rag picking is also observed in other major cities in India (Delhi, Bombay, Calcutta, Bangalore).

6.38 Many of these children live with their families who are engaged in a similar occupation while others are destitute children. They earn around Rs.5-6 per day. The destitute children engaged in this occupation live on the pavements and eat their meals at way side restaurants. On some days when these children are unable to collect sufficient money to buy food, they pick up stale food from the garbage and eat it. Some of them keep shifting their area/town of operation at their free will and may return to the same locations after a period.

6.39 The nature of work and the work environment are very unhygienic. These children rummage through dustbins and heaps of filth to pick rags. Their hands are stained black with scrabbling in rubbish. Frequently they cut their hands while picking up glass or a rusted strip of metal. This leads to infection. They are prone to a lot of skin diseases too. Eating stale and contaminated food, they often suffer from gastro-intestinal infections which prove fatal due to lack of timely treatment. Hook worm infestation is also very common among these children.

6.40 The destitute children engaged in this occupation are said to be very independent. Their family circumstances (According to an estimate by Don Bosco Anbu Illam, Madras, 60% of them come from broken homes) and the harsh economic reality make them very tough and rigid. They spend all their money and have limited savings. They are also prone to getting into bad habits like drinking, gambling and drugs due to their access to money and at times also get involved in crime. These children need special care and attention. Don Bosco's Anbu Illam in Madras provides a shelter to 200 such street boys. These children are given some non-formal education, vocational training, counselling and more important, love and affection. The centre has also organised a co-operative paper shop to avoid their exploitation by middle men.

CONDITIONS OF WORK OF CHILDREN

6.41 As seen in the earlier sections, the working conditions of children are usually harsh and exploitation in the form of extreme subordination is frequent as children are far more vulnerable than adults. The other forms of exploitation are

- (1) Very low remuneration and in some cases no pay. Apprenticeship schemes are very common in the small enterprises in the informal sector.
- (2) Children are mostly employed on piece rate system which places undue strains upon them and makes them vulnerable to abuses such as unjustified deductions.
- (3) Hours of work are long (8 hours) and in some cases excessive (10-12 hours). This is in direct contrast to $4\frac{1}{2}$ -5 hours prescribed under various laws.
- (4) Night work is not uncommon, especially in small workshops and service establishments such as eating places.
- (5) Hazardous nature of work and unsafe working conditions are perhaps the greatest single cause of concern. Examples are match and fireworks industry, mechanical workshops etc.
- (6) Some of the occupations in which children work expose them to health hazards (Table 6.1)

TABLE 6.1
HEALTH HAZARDS OF WORKING CHILDREN

OCCUPATION	HEALTH HAZARDS
1. Beedi industry	Chronic bronchitis and Tuberculosis
2. Handloom industry	Asthma, Tuberculosis
3. Rag pickers	Tetanus, Skin diseases, Gastro-intestinal infections
4. Match and Fireworks industry	Accidents, Burns
5. Hosiery	Respiratory diseases

- (7) Physical and mental abuse in the form of separation from parents, isolation and at times virtual imprisonment and physical cruelty.
- (8) Since these children work in the informal unorganised sector, they are denied privilege leave and other statutory benefits like provident fund.
- (9) These children are also deprived of social welfare programs like health care, non-formal education and supplementary feeding which concentrate primarily on school going children. The effects of all these on physical and mental development of the working child are far reaching and irreversible.

PRIORITY NEEDS OF WORKING CHILDREN

6.42 While these working children face very harsh working conditions and frequently come from very poor families, they are excluded from most of the social welfare schemes as these concentrate on school going children. It is estimated that a large number of working children suffer from severe malnutrition and anaemia. Still none of the supplementary feeding programs in the State cover this target group. Labour fatigue and inadequate sleep makes them more susceptible to infectious diseases and their occupation makes them vulnerable to many health hazards. However, there exists no health check-up and referral system for this group (unlike school health scheme which covers school going children). Thus, their exclusion from school deprives them of education, health and nutrition. While the system of non-formal education exists for school drop-outs, the working children are not covered under this due to legislative and organisational mis-match. While the Factories Act which was in force prior to 1986 banned the employment of children under 14 years in factories, the non-formal education programme was to be targeted at children in the age group 6-14 years. Thus, if children were working in factories, they were not supposed to be under 14 years and if they were more than 14 years, they were not to be included under the system of non-formal education.

6.43 Thus, there exists an urgent need to extend the basic welfare services to the working children. In the long run it would be necessary to remove the root cause of child labour by providing employment and income-generating schemes to their families.

6.44 Many of these working children are street children (who have family ties but remote) or abandoned children. It is these children who are more prone to child abuse, exploitation and delinquency. These children need care and protection, besides basic services like education, health and nutrition. It is alleged that the conventional care approach (institutional) which is currently popular, isolates the child from his/her natural environment—namely the community and the work environment—and deals with the symptoms rather than with the socio-economic context which gives rise to family breakdowns, child labour and abuse. Further, this approach benefits only a very tiny proportion of millions of children at risk and is often expensive. There is an urgent need for a community based approach in this area, which would tackle the root cause of the problem.

GOVERNMENT POLICY ON CHILD LABOUR

6.45 In 1987, the Government of India formulated National Child Labour Policy. The thrust of this policy consists of three complementary measures. The first deals with legislative aspects. The policy envisages strict enforcement of the provisions of the Child Labour Act, 1986

which prohibits employment of children (below 14 years) in hazardous occupations and regulates their employment in others. This act provides the much needed legitimacy in the design and implementation of programs for working children.

6.46 The second step deals with socio-economic factors bearing on child labour. The policy anticipates the development of an extensive system of non-formal education for working children. It has also planned to increase provision of employment and income-generating schemes in areas with high incidence of child labour. A Child Labour Cell has been constituted under Ministry of Labour, and it encourages voluntary organisations to participate in activities like non-formal education, vocational training, provision of health care and nutrition education to working children.

6.47 In addition, the National Policy on Child Labour provides for industry and area specific pilot projects, in areas known to have high incidence of child labour and are notorious for the dangerous conditions in which children work. The strategy is to implement model programmes consisting of key elements, such as stepping up the enforcement of the prohibition of child labour, providing employment to families of working children, expanding formal and non-formal education, and promoting school enrolment through various inducements, such as payment of stipends. The pilot scheme, if successful, will be replicated at the All India level.

6.48 Ten areas having concentration of child labour have been identified for the proposed project activities. These include match industry in Sivakasi (Tamil Nadu), Gem polishing industry at Surat (Gujarat) and Jaipur(Rajasthan), Slate industry in Makrapur (Andhra Pradesh), Pottery industry in Khurja (UP), brassware industry in Moradabad (UP) and glass industry in Ferozabad (UP). These programmes will cover 30,000 children in selected areas.

7.

Disability, Destitution and Delinquency

DISABILITY

7.1 According to a report of the National Sample Survey Organisation on disability survey (conducted in July-December 1981, covering 332 villages and 992 households in the State), 2% of the State's population is physically handicapped (All India average 1.8%). This translates to close to 1 million physically handicapped people of which 20-25% are believed to be children below 14 years. Locomotor disability accounts for the largest number (59%) followed by hearing (21%), and visual(20%). The survey did not include estimation of mental retardation. However, this is likely to be high as the incidence of Down's syndrome is fairly high at 1 in 800. (Source: Down's Research Society, Madras); Congenital Malformations are observed frequently and iodine deficiency is also found in some pockets (eg. Nilgiris).

DEFINITION OF A DISABLED CHILD

The United Nations defines a disabled child as one who is unable to ensure by himself, wholly or partially, the necessities of normal individual or social life including work, as a result of deficiency whether congenital or not, in his physical or mental capabilities. Disabled children thus include: Children who are partially sighted or totally blind, partially or profoundly deaf, orthopaedically handicapped, mentally retarded, the slow learners and those affected by multiple handicaps. The disabled, it is estimated constitute around 1% of the world's population.

PREVALENCE RATES FOR DISABILITY

7.2 The survey also estimated the prevalence rates of disabilities in children (Table 7.1). Locomotor disability was most prevalent followed by communication and visual disabilities in that order. Further, prevalence rate for locomotor disabilities is significantly higher in urban areas than rural areas. The possible causes could be the higher prevalence rates of residual polio in urban areas estimated at 8 per 1000 children in the age group 5-9 years vis-a-vis 7 per 1000 in rural areas. Occurrence rate for accidents is significantly higher in urban areas.

TABLE-7.1

PREVALENCE RATES IN CHILDREN (PER 100,000 POPULATION WITHIN THAT PARTICULAR AGE GROUP)

DISABILITY	0 - 4		5-14	
	RURAL	URBAN	RURAL	URBAN
Locomotor	435	540	676	718
Hearing	-	-	314	244
Speech	-	-	411	429
Visual	39	25	66	87

DEMOGRAPHIC PROFILE OF THE DISABLED

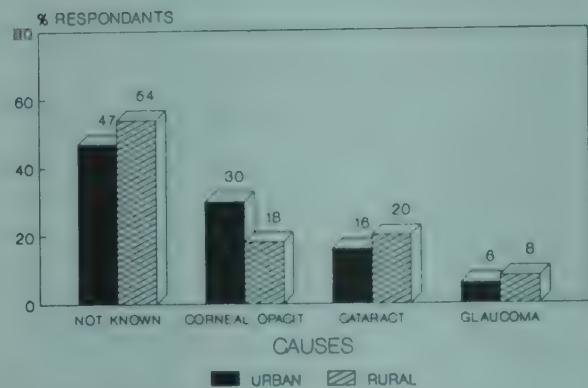
7.3 State specific data is not available on demographic profile of the disabled. At the All India level, the distribution of physically handicapped persons over rural and urban areas is 81 and 19 percent respectively. The percentage of males and females is the same in rural and urban areas at 57:43 which suggests that the incidence of disability is higher among males.

CAUSES OF DISABILITY

7.4 NSS data (All India) reveals that 30-60% of disabled people did not know the cause of disability. Among others non-treatment of diseases and occurrence of disability following an illness were given as the major causes. Exhibit 7.1 indicates the cause for each type of disability.

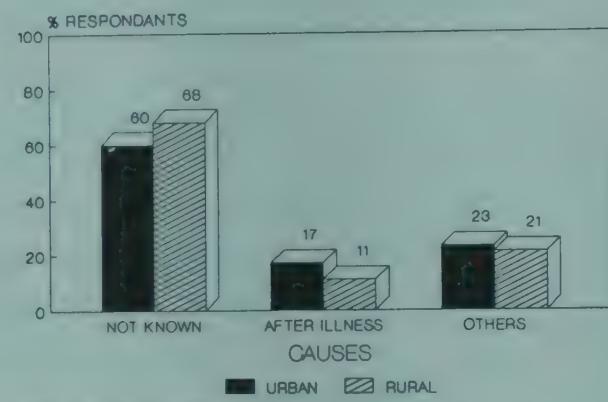
EXHIBIT 7.1

CAUSES OF DISABILITY -VISUAL (ALL INDIA)



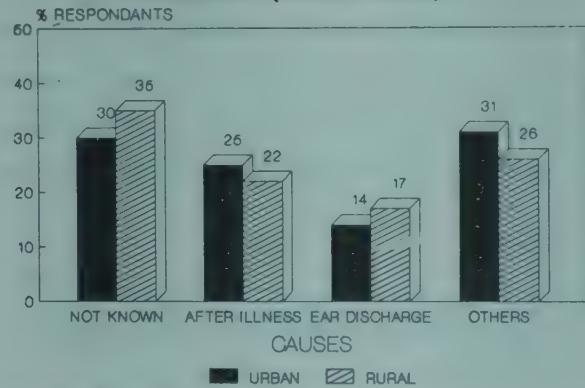
Source:NSS Disability Survey,1981

CAUSES OF DISABILITY -SPEECH (ALL INDIA)



Source:NSS Disability Survey,1981

CAUSES OF DISABILITY -HEARING (ALL INDIA)



Source:NSS Disability Survey,1981

CAUSES OF DISABILITY -LOCOMOTOR (ALL INDIA)

- POLIO
- INJURIES
- STROKE
- CEREBRAL PALSY
- OTHER ILLNESSES

Source:NSS Disability Survey,1981

SOCIO-ECONOMIC PROFILE OF THE DISABLED

7.5 NSS data (All India level) reveals that the literacy rate among the physically disabled persons is very low, specially in the rural areas (exhibit 7.2). Unemployment is also widely prevalent (exhibit 7.3). Visually disabled, in both urban and rural areas are

among the worst sufferers with the lowest literacy rate and highest unemployment (exhibit 7.4).

EXHIBIT 7.2

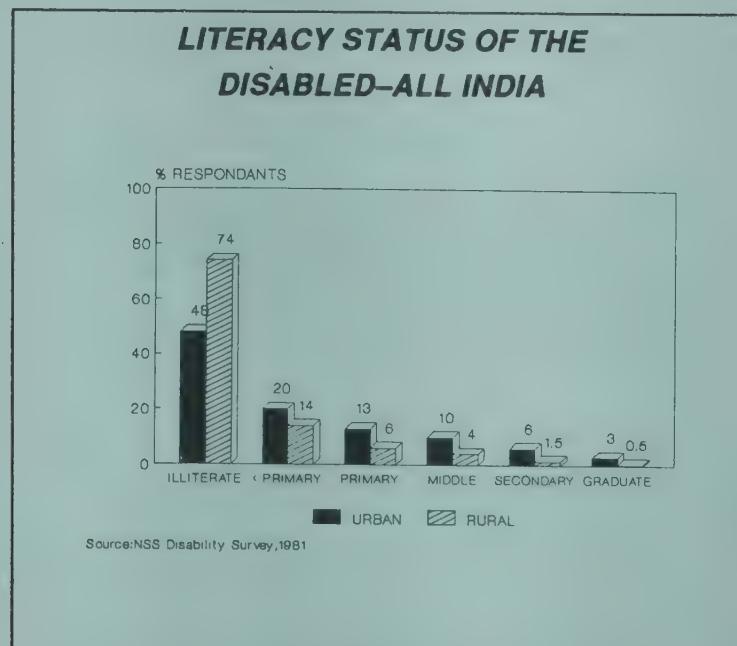


EXHIBIT 7.3

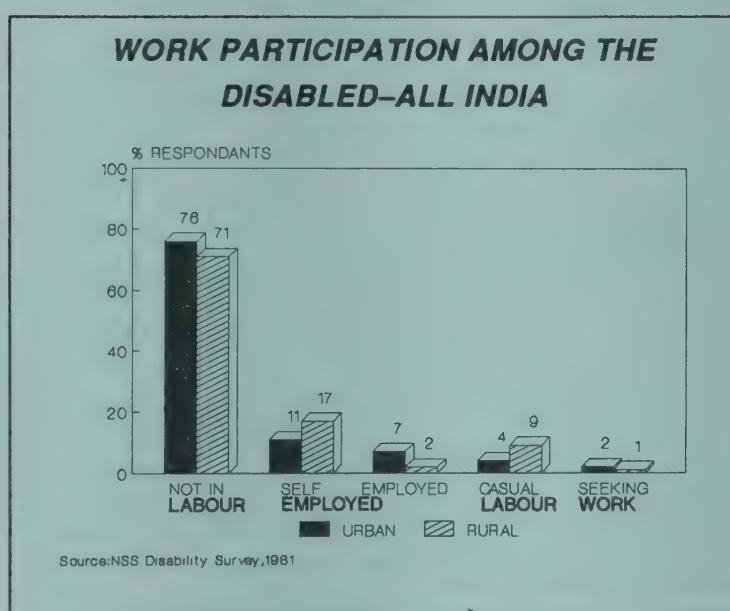
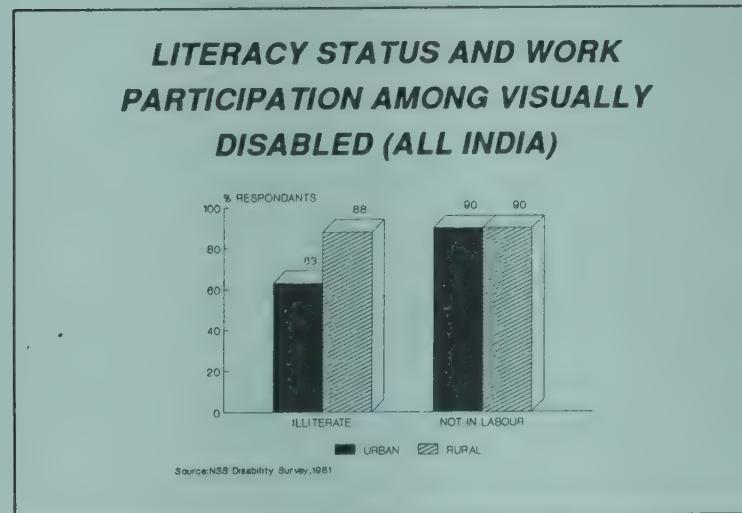


EXHIBIT 7.4

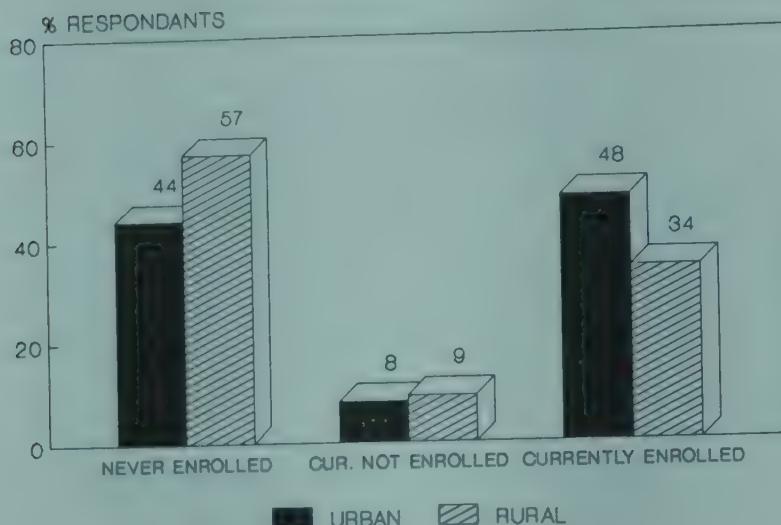


SCHOOL ENROLMENT AMONG DISABLED CHILDREN

7.6 Exhibit 7.5 gives the school enrolment among disabled children. Only one out of ten blind children in the age group 5-14 years, both in urban and rural areas is attending school. Among children with other disabilities (hearing, speech and locomotor), the proportion who enrolled in school was higher.

EXHIBIT 7.5

SCHOOL ENROLMENT AMONG PHYSICALLY DISABLED CHILDREN (ALL INDIA)



Source: NSS Disability Survey, 1981

PRIORITY NEEDS OF DISABLED CHILDREN

7.7 As can be seen from the above sections, the situation of disabled persons in general and children in particular is far from comfortable. Given the priority for development of children, prevention of these conditions should be the overriding concern. Detection and early intervention can cure or reduce many of the disabling conditions prevalent in our societies.

7.8 For example, immunisation against polio and other childhood diseases, obstetric care and other maternal and child care services, regular intake of Vitamin A by children and use of iodized salt, can prevent a range of disabilities.

7.9 Disability prevention needs to be a multi-disciplinary and multi-sectoral endeavour involving the sectors of nutrition, health, education, employment and social and child welfare. An effort to prevent disability will be an appropriate and accelerated extension of the activities in these sectors.

7.10 Once a disability occurs, the effort on treatment and rehabilitation becomes prohibitively costly in time and money. However, given the size of the disabled population, there is no alternative but to organising support for those already disabled.

7.11 Disabled children need special education and training to bring about their socio-economic rehabilitation. Rather than having special schools for the disabled, normal schools should take on this burden by setting up special facilities and approach for these children. This would go a long way in rehabilitating these children within the family surroundings and enabling them to be economically independent in future.

7.12 Early detection and intervention are the other areas which need urgent attention as these can reduce the severity and/or consequences of disabling conditions. With this objective a District Rehabilitation Centre has been set up at Chingleput district on a pilot basis. However, there is an urgent need to extend the coverage of such services throughout the state. Primary health centres/Health Sub-centres could play a useful role towards achieving this.

SERVICES FOR THE DISABLED

7.13 While some services for the disabled exist in the voluntary sector, with or without government support, the coverage of these is inadequate to meet the needs of the large number of disabled children or adults. The existing rehabilitation services are limited in number and mostly in the urban areas.

7.14 The State Government's role in this sector has been supportive. It allocates Rs.4.9 crores per annum for the welfare of the disabled. The Department of Social Welfare has been entrusted with this responsibility. The department has been implementing a number of schemes for the disabled. These include:

- (1) Provision of special education through special schools for the disabled. There are 50 special schools functioning in the State of which approximately 50% are Government-owned while the remaining 50% are Government-aided, benefiting 4840 physically disabled children. The State Government also provides scholarships and book allowance which benefit 2080 and 8400 disabled children respectively annually. The Government has also set up 20 pre-schools for the education of deaf children in the age group 2-4 years.
- (2) Government provides vocational training to the disabled through special institutes. The five institutes set up for this purpose provide training to 150 disabled persons annually.
- (3) The Government has been putting a lot of emphasis on creating employment opportunities for the disabled.
 - 3% vacancies in all State public services and educational institutions have been reserved for the disabled (1% each for blind, deaf and orthopaedically disabled).
 - A staff selection committee has been constituted to ensure that there is adequate representation in the reserved vacancies.
 - An unemployment allowance of Rs 50-100 p.m. is paid to the blind (18-40 years) seeking work.
- (4) Government provides assistance for self employment to the disabled in form of a subsidy and loans. The scheme covers 2400 persons every year. The Government also supplies aids and appliances like tricycles, wheel chairs and hearing aids to the disabled.
- (5) Five regional rehabilitation centres have been set up at Madras, Vellore, Thanjavur, Madurai and Coimbatore. These provide comprehensive rehabilitation assistance to the disabled (coverage 5800 annually).
- (6) A District Rehabilitation Centre (DRC) has been set up at Chingleput to ensure comprehensive services for the handicapped for prevention and early detection of

disability, creation of awareness in the rural community about the availability of services for the disabled and counselling for the individual and family through multipurpose rehabilitation worker in order to help the disabled person overcome his disability through provision of appropriate aids and appliances. DRC is an important strategy to reach out to the disabled children in rural India.

THE NEW THRUST

7.15 The Government recognises the fact that seventy percent of the disabilities are preventable and in a large number of cases the impairment can be cured or the disabling effects reduced to a great extent with timely detection and intervention. In recent years several initiatives have been taken in mobilising the grass root level agencies (Community Health workers, Anganwadi workers, village teachers etc.) in early detection and management of handicaps. Efforts have also been initiated in creating awareness among parents for better home management of these children.

7.16 In view of the importance of assisting in their education, the Government of India has also launched a Centrally sponsored scheme for the Integrated Education for the Disabled Children. Under the scheme 100 percent financial assistance is provided to the implementing agencies for developing facilities in schools so that certain categories of the physically handicapped children may be able to study along with other normal children.

7.17 The Government of India also proposes to bring a comprehensive legislation for the disabled. A committee has been constituted for this purpose at the centre. These efforts need to be extended to Tamil Nadu.

DESTITUTE CHILDREN

7.18 There is no reliable data on the magnitude of the problem of destitution among children in Tamil Nadu. A part of the problem is due to lack of exact definition of the term destitution. A survey by Don Bosco Institute of Social Work, Tirupattur estimates that there are 27000 'street children' in Madras alone. Another survey conducted in 1971, estimated that there are about 1.5 million 'orphans' in the State. Of these 40% are estimated to be destitute orphans (All India ratio).

7.19 It is also very difficult to gauge whether the number of destitute children is likely to increase or decline in the near future. Though there has been a significant increase in life expectancy, the forces of industrialisation, urbanisation, gradual dismantling of the joint family system, population explosion and increasing number of people living below the poverty line may result in the problem of destitution assuming larger proportions.

DEFINITION

A child whose parents are unable to discharge their responsibility towards him on account of poverty or ill health, a child without parents or any near relative or any means of subsistence; a child forced into begging or hazardous occupation, a child whose parents indulge in prostitution, drunkenness or crime is termed destitute in common parlance.

7.20 According to an estimate by Don Bosco's Anbu Illam, the major causes for children on the street are:

- 60% broken families.
- 20% poverty and hunger.
- 15% fun and thrill.
- 5% orphans.

7.21 In Tamil Nadu, the problem of unemployment is rampant. According to NSS estimates (Survey on Employment and Unemployment, 1986) close to 12% of individuals in the age group 15-30 years and 4% in the age group 30-60 years were unemployed. In the rural areas the figures were even higher at 11% in the age group 15 to 30 years and 9.5% in the age group 30-60 years. Poverty is also widely prevalent in the State with 40% of the State's population living below the poverty line. With increasing urbanisation, and population pressures in the city, slums are mushrooming (according to an estimate close to 32% of people in Madras live in slums) and crime is on an increase. Alcoholism is widely prevalent and is one of the major causes of broken homes.

SERVICES FOR THE DESTITUTE

7.22 Service for the destitute and orphans can broadly be classified into two categories namely institutional and non-institutional. Institutional services include care and maintenance of children, provision of their education and training and specialised services for their rehabilitation through the institutions specially set up for the purpose. Non-institutional programmes comprise adoption, foster care, sponsorship and programmes aimed at strengthening the family for better care of children.

INSTITUTIONAL SERVICES

7.23 The most common form of institutional services for the destitute children is that of an 'Orphanage' or 'Children's Home'. Both the voluntary sector and the Government play an important role in providing this service. According to an estimate there are 37 orphanages functioning in the State catering to 60,000 children in the age group 5-18 years. Of these 22 orphanages (benefiting 5200 children) are under the Government sector.

7.24 With the objective of rehabilitating destitute children and orphans in a family atmosphere, the Government of India has introduced a 'cottage scheme' on the lines of SOS children's village. Each cottage is treated as a unit and consists of 25 children and a house mother. The house mother is responsible for meeting all the needs of the children, treating children of the cottage as her own. These cottages are managed by the voluntary organisations who are given grants-in-aid by the Government (90% of the expenditure). As of 1988-89, there are 160 voluntary organisations receiving this grant. The scheme benefits 13,500 children and costs Rs. 3.6 crores to the State Government.

7.25 In an effort to expand and improve institutional and non-institutional services for the children in need of special care, the Ministry of Social Welfare has launched a Centrally sponsored scheme in 1979-80 entitled "Scheme for the welfare of children in Need of Care and Protection" which was modified in 1985. The main objective of the scheme is to provide

welfare services to destitute children for rehabilitating them as normal children. (Under this scheme grants-in-aid are available to various voluntary organisations. During 1988 a budget provision of Rs.2.7 crores was made at the All India level). Under this scheme institutionalisation is considered as a last resort. The emphasis is placed on non-institutional programmes like adoption, foster care and sponsorship.

7.26 However, in the Indian context adoption has not yet developed as a child placement service as there is no uniform law on adoption. Only Hindus can adopt children under Hindu Adoption and Maintenance Act, 1956. The lack of a uniform law on adoption is seen as the major drawback depriving children of an opportunity for development. The Ministry of Social Welfare has also introduced a scheme of foster care which has not gained popularity due to following reasons:

- (1) Financial assistance offered to families is unrelated to actual expenses incurred by the family and is inadequate.
- (2) Most of the agencies have limited experience and expertise in overseeing such work.
- (3) Care of a child by a family which is not related is rather unconventional in the Indian Social system.

7.27 Sponsorship programmes have also not become popular in India. In this context family helper projects initiated by organisations such as Christian Children's Fund need to be promoted and popularised.

7.28 However, as said earlier most of these services have a very limited coverage and bulk of the destitute children remain on the streets with total responsibility to fend for themselves. Most of these children are engaged in occupations such as rag pickers, shoe shines and helpers in road side restaurants. They are unprotected and are vulnerable to many dangers and abuses. Deprived of love and affection, sympathy of a family and subjected to exploitation, abuse and unhealthy working conditions, these children develop a complex character with inferiority, the insecurity, guilt and hatred constantly haunting them. Because of pavement dwelling and the nature of their work they have to constantly encounter police action and are often falsely accused and beaten up. This coupled with alienation from the mainstream of life and lack of socialisation leads them to anti-social activities. Similarly, deprivation of education and intellectual development makes them illiterate and condemns them to low wages all their life.

7.29 To set right the situation, there is an urgent need for the remedial measures in terms of:

- (1) Assessing the magnitude of the problem and reaching out to these children who are deprived of family support.
- (2) Through collective efforts of police, local authorities and the Government, develop a comprehensive development plan for these children.
- (3) Extend the basic welfare services like nutrition, education, recreation, health and vocational training to these children.
- (4) Set up an agency which would ensure their protection and counselling.
- (5) To stimulate public awareness through media towards needs and problems of the street children.

7.30 In Tamil Nadu very little is being done for street children. There are only 2 or 3 voluntary organisations who offer shelter for these street children. There is an urgent need to encourage participation of voluntary agencies in this area.

DELINQUENT CHILDREN

7.31 Delinquency is a phenomenon of anti-social behaviour where the child comes in conflict with the law. As discussed earlier, street children who are unprotected and uncared for, are vulnerable to anti-social behaviour. Even among children living in family surrounding, anti-social behaviour is not uncommon. The reasons for this are many:

- (1) Neglect by parents
- (2) Poor upbringing, lack of moral values
- (3) Abject poverty
- (4) Broken homes
- (5) Alcoholism or prostitution in the family or
- (6) Criminal parents.

7.32 These children need to be dealt with special care. If left to the ordinary judicial system, they will be condemned and there would be no scope for their improvements and rehabilitation in future. In view of this the Government has framed a separate statute to deal with delinquent children.

7.33 Until recently these children were dealt with, within the framework of Children's Acts which were specific to each State (In Tamil Nadu, the Tamil Nadu Children's Act 1920 was in operation). This has been replaced by a Central Act called Juvenile Justice Act, 1986 which came into force since 2nd October 1987.

7.34 According to this Act, the Juvenile Welfare Board would have the powers to enquire into the matter relating to the neglected juveniles. In accordance with the act, 13 Juvenile Welfare Boards have been constituted in Tamil Nadu for the purpose. The matter relating to delinquent juveniles would be dealt with by a Bench of Salaried Magistrates. The constitution of the bench of magistrates for Tamil Nadu is yet to be formulated. Uncontrollable children are proposed to be produced before the Child Welfare Board by the parents and guardians.

JUVENILE DELINQUENCY

Includes three categories of children

- (a) Neglected
- (b) Delinquent
- (c) Uncontrollable

7.35 The above Act ensures a uniform legal framework for juvenile justice in the country, so as to ensure that no child under any circumstances is put in jail or police lock-up. It also provides a comprehensive scheme for the care, protection, treatment, development and rehabilitation of neglected and delinquent juveniles. It lays down appropriate linkages and co-ordination between the formal system of juvenile justice and voluntary organisations.

INSTITUTIONS UNDER THE ACT

7.36 There are 20 special/juvenile homes (long stay) in the State under the Act of which 10 are run by the Government and 10 by voluntary organisations with Government aid. There are 14 observation homes (short stay) in the State, of which 11 are run by the Government while the rest are run by private voluntary organisations. These act as feeder homes to special/juvenile Homes.

7.37 The Department of Approved schools and Vigilance service is the State level agency for overseeing the activities of the special, juvenile and observation homes.

IMMORAL TRAFFIC (PREVENTION) ACT, 1956 (AMENDED IN 1978)

7.38 This is a Central Act which came into force from 26th January 1987. Under the Act, there are Government Vigilance institutions (long stay) which have been set up which admit girls exposed to moral danger and those that seek admission voluntarily. There are 6 Government vigilance/protective homes operating in the State currently. Apart from this, there are 8 vigilance rescue shelters (short stay) which receive and take care of the girls and women during the period of trial before the courts. The Department of Approved Schools and Vigilance Services oversees the activities of these institutions also. The Department spends Rs. 2.3 crores per annum on all these institutions.

AFTER CARE INSTITUTIONS

7.39 There are 3 after care institutions established under the Juvenile Justice Act, 1986, at Vellore, Athur and Madurai. These homes provide continuous vocational training to the dischargees of special/juvenile homes.

7.40 All special/juvenile homes are recognised educational institutions, providing education upto 8th standard. Vocational training is also being imparted at many institutions.

THE FUTURE THRUST

7.41 The future thrust should be to rehabilitate these children in normal family surrounding. They would need some counselling to bring them back on the normal path. This is a complex task and would need services of an expert in the field. Towards achieving this the State Government has set up juvenile guidance bureaus at Madras, Madurai and Vellore. These investigate attitude and behaviour of inmates, referred to them by Juvenile Welfare Board/Juvenile Court and suggest remedial measures.

7.42 The inmates of these institutions are also rehabilitated into the society as normal citizen after reformatory training at the institutions. The methods of rehabilitation include:

- (1) Arranging marriages for willing girls and women
- (2) Securing employment assistance
- (3) Assistance to boys who want to start a vocation etc.

7.43 Financial assistance is also provided to needy girls discharged from these institutions from a fund called "Tamil Nadu Welfare Fund" for rehabilitation of victims of moral exploitation. However, the coverage under these scheme remains limited.

8. Environment

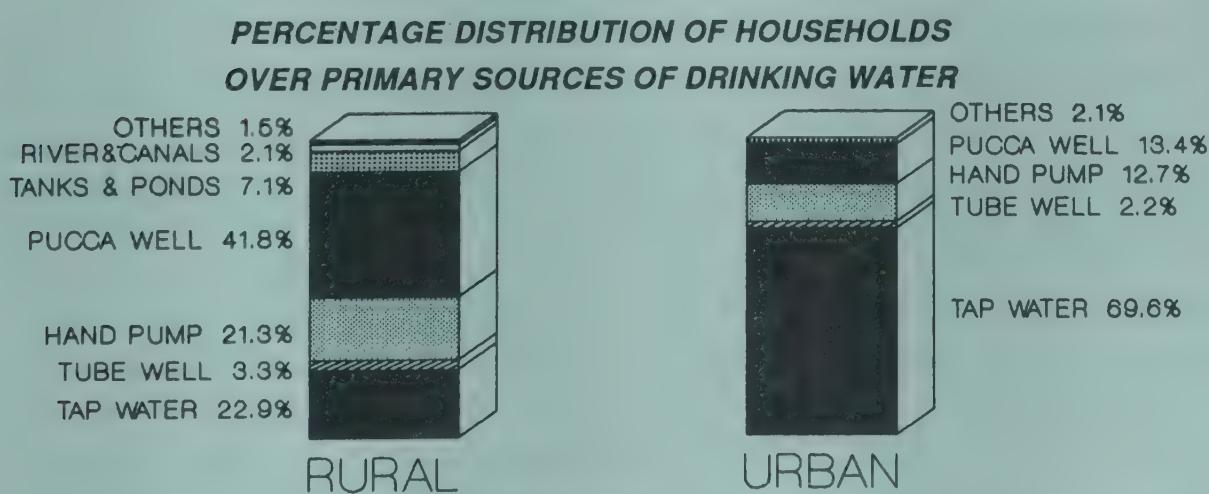
8.1 The physical and psychological development of a child is influenced by the social, cultural and physical environment in which it grows up. The natural environment in which children are born and are expected to grow up has been deteriorating, largely through its shortsighted manipulation by man. Population pressures have made the availability of safe drinking water, housing and sanitation facilities extremely scarce. This chapter provides a brief discussion of the situation in respect of each of the environmental factors.

WATER

8.2 Water scarcity in Tamil Nadu must be viewed against the physical and demographic factors affecting the availability of water. Monsoon periods of varying precipitation and their vagaries control the surface water and ground water recharge in Tamil Nadu. Evaporation of water available in various forms is high. About 750 mm of the yearly average rainfall of 945.7mm goes into storage in soil, without runoff. Although some recharge to ground water takes place without run-off, there is a significant run-off only when rain storms are heavy enough to exceed the infiltration rate and overcome surface detention. The State is fed by surface irrigation system through five independent major river basins of Palar, Pennar, Cauvery, Vaigai and Thamiraparani. The State has already harnessed all the rivers and is using almost 94% of the total available surface water.

8.3 Providing adequate quantities of potable water is a major concern of the State. Over the years various schemes have been implemented to make the tap water available in rural/urban areas. Close to 70% of households in urban areas and 23% of households in rural areas have access to tap water (Exhibit 8.1) 26% of households in urban areas and 63% in rural areas continue to depend on wells/borewells for drinking water. Potability of water from well/borewell has been tested only in few select cases as it is not a routine practice.

EXHIBIT 8.1



SOURCE: 38th BOUND OF N.S.S.T.N.1983

8.4 It is universally accepted that adequate supply of pure water for drinking, personal hygiene and other domestic purposes and adequate means of waste water disposal are essential to public health and well being of people, including children. Improvement in water supply and sanitation can directly tackle, widely spread water-related illnesses like diarrhoea, typhoid, cholera and malaria, which are some of the major causes of morbidity among children in the State.

8.5 Villages which do not have the source of drinking water within a distance of 1.6 km or depth of 15 metres, or villages where the available water is not potable either because of salinity or toxicity or susceptibility to infections are classified as "problem villages". The State Government under their Minimum Needs Programme and the Central Government with its Accelerated Rural Water Supply Programme have been looking at covering these problem villages by provision of safe and perennial source of drinking water since 1972-73. Though the coverage under the successive plan periods was good, on account of repeated failure of monsoons in Tamil Nadu during 1980-85 period, 14,826 new problem habitations have been identified. The State Government (with assistance from the Central Government) proposed to cover all problem villages during the Seventh Plan period, with a total investment of Rs.275 crores. As on 1 April 1988, 13,597 problem habitations continue in the State.

8.6 Out of 753 local bodies (with an estimated population of 16.5 million in 1981) other than village panchayats in Tamil Nadu, 336 local bodies (population 11.9 million) have been covered under the various water supply schemes of the Tamil Nadu Water supply and Drainage (TWAD) Board. Water supply schemes are currently under operation in 100 towns. During the Seventh Five Year Plan, a provision of Rs.500 crores has been made towards Urban Water Supply Schemes. In 1989-90 alone it is proposed to spend Rs.160 crores on urban water supply schemes.

8.7 The TWAD Board is also implementing a water supply and sanitation project with assistance from the World Bank to provide water supply to 75 medium towns and 740 rural habitations where no facilities now exist. Water supply augmentation schemes are also being implemented in 3 major cities of Coimbatore, Madurai and Salem with the assistance from the World Bank.

SANITATION

8.8 Close to 91% of rural and 40% of urban households, do not have latrines (Table 8.1). About 6% of rural and 18% of urban households still depend on service-type latrines (night soil removal system). In the absence of latrines, in the rural areas open fields are used but in urban areas use of public parks, railways tracks and road sides is quite common.

TABLE 8.1
PERCENTAGE DISTRIBUTION OF HOUSEHOLDS
BY TYPE OF LATRINES USED

		RURAL	URBAN
No latrines		91.0	40.0
Service	: Shared	2.6	11.1
	Exclusive	3.0	6.7
Septic tank	: Shared	1.1	8.7
	Exclusive	0.7	5.7
Flush system	: Shared	0.7	15.1
	Exclusive	0.6	11.2
Others	: Shared	0.1	0.3
	Exclusive	0.2	1.2
		100.0	100.0

Source: 38th Round of NSS, T.N., 1983

8.9 The objectives of the International Drinking Water and Sanitation Decade (1981-90) include:

Water supply : Urban-Rural : 100% coverage of population.

Sanitation : Urban : 80% coverage of population with either sewerage system or sanitary toilets, connected to safe disposal systems

Rural : 25% coverage of population with sanitary toilets.

8.10 While the objective in the area of water supply seems achievable in view of the ground already covered, in the area of sanitation the fulfilment of the objective remains a distant dream.

GOVERNMENT PROGRAMMES

8.11 The Government is currently concentrating on improving sanitation and sewerage facilities in urban areas. Currently underground sewerage facilities have been provided either fully or partially in 16 of 753 towns. Sewerage schemes are under execution in 4 more towns. In other urban areas, there are mostly open drains, which too at times are inadequate. Treating of sewerage water, establishment of sewerage farms etc. are being attempted by very few municipalities and town panchayats. In most cases the drainage is disposed off in wasteland.

8.12 During the Seventh Plan period the Government is implementing with the World Bank Assistance the low cost sanitation project in 14 towns. The project aims to construct close to 30,000 units of which 23,000 have already been completed. It has been observed that the mere provision of "physical facilities" does not really solve the problem. A change in basic attitudes and practices is necessary to convince people to use these latrines.

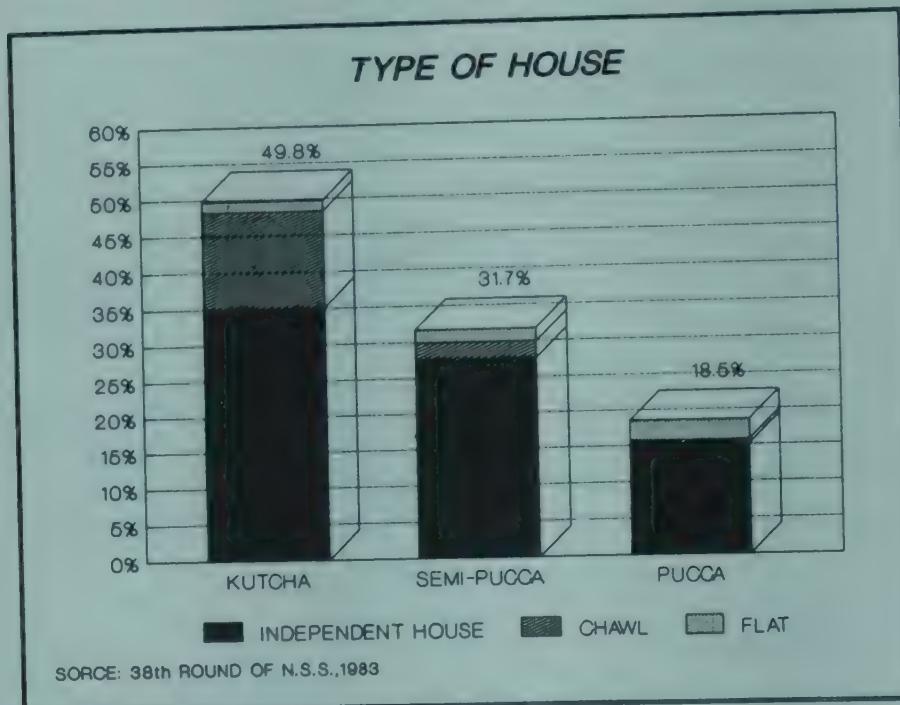
HOUSING

8.13 Investment in housing has failed to keep pace with the population growth and both the average size of the household and the number of houseless people are on an increase. As per the 1981 census, 119 persons per lac are houseless, most of them living in urban areas. In Thanjavur and Madras city 20% and 12% of population is houseless respectively. In addition there are many who live in slums.

TYPE OF THE HOUSES

8.14 The type of house in which a family lives is an indicator of their economic status. Almost 50% of the households in the State live in kutcha houses and 32% in semi pucca houses (Exhibit 8.2). Only 18% of households live in pucca (permanent) houses. There is lot of congestion in urban areas. There are 57 households per sq km in rural areas while in urban areas the figure is much higher at 553 households/sq.km. In urban areas 43% of the households live in rented accommodation reflecting inequalities of income and wealth distribution.

EXHIBIT 8.2



URBAN SLUMS

8.15 Tamil Nadu has one of the highest proportions of urban population in the country. At 33%, it is the second largest urbanised State. During the 1971-81 period, the rate of growth in urban population is much higher at nearly 28% as compared to around 17% in the total population of the state and it is forecast that by 2001, close to 40% of State's population will live in urban centres.

8.16 About 46% of the urban population lives in the State's five largest cities, viz. Madras, Madurai, Coimbatore, Tiruchi and Salem. With population pressures and widespread poverty, the availability of housing is scarce, giving rise to large urban slums. According to an estimate by The National Institute of Urban Affairs, close to 17 percent of population in these five large cities live in slums. This is an alarming trend.

CLASSIFICATION OF A HOUSE

A kutcha house is one whose walls and roofs are made of mud, bamboo, grass, leaves, reeds, thatch or unburnt bricks.

A pucca house is one whose walls and roof or at least walls are made of burnt bricks, stone, cement concrete or timber or cement plastered reeds. Tiles, galvanised tin and asbestos cement sheets used in construction of roofs will be regarded as pucca materials.

A semi pucca house is one in which either the roof or walls are made of pucca materials like burnt bricks, stone, cement concrete or timber.

A slum is characterised by narrow passages, no sanitation, congestion, vulnerable to destruction by fire, no free air and no potable water facility. Even if pucca materials are used in construction of slums they do not qualify to become a house as minimum space and other facilities are not available.

LIVING CONDITIONS IN URBAN SLUMS

8.17 A survey of 2.8 lakh families in urban slums of Tamil Nadu by National Institute of Urban Affairs revealed some disturbing facts:

- Close to 46% of slum families live below the poverty line.
- 56% of slum families were in debt. Around 60% of families had incurred the debt to meet recurring household expenditure including religious ceremonies.
- Close to 42% of people in the age group 18-45 years are unemployed.
- Close to 40% of slum dwellers do not even own that dilapidated house and have taken it on a monthly rent of Rs.78.
- Water connection is available only in 14% of houses and electricity connection in 38%. A majority of families depend upon public or community water points and have practically no access to sanitation. They use open areas around their habitations for defecation.
- close to 25% of children in the age group 6-17 years are neither at school nor employed.

8.18 The poor living conditions and poverty have a definite impact on the nutrition and health status of the urban slum dwellers. As indicated in many nutrition and health surveys, the prevalence of malnutrition and deficiency diseases is much higher in urban slums. Morbidity on account of diseases like diarrhoea (water borne), respiratory infections (caused due to air pollution) and polio, TB and leprosy (due to overcrowding) is much higher in urban slums than in rural areas. Infant and child mortality in these urban slums are far higher inspite of better access to health facilities.

GOVERNMENT PROGRAMMES

8.19 The State Government recognises this and a number of schemes are being implemented for improving the living conditions of the urban poor in the State. Many of the welfare programmes in the State including mother and child health care programmes lay a special emphasis on urban slums (for eg. ICDS has 37 projects operating in urban slums and MUDP has a component of MCH). The Tamil Nadu Slum Clearance Board (TNSCB) is the principal agency of the Government which implements a variety of programmes aimed at improving the urban poor in the slum areas. The Tamil Nadu Housing Board (TNHB) is also implementing Sites and Services project aimed at providing appropriate housing to slum dwellers. Table 8.2 provides the list of programmes in the area of slum improvement and their objective and coverage.

PROGRAMME IMPACT

8.20 Considering the magnitude of the issues involved in tackling the many facets of poverty in urban areas, the achievements under the various schemes of the TNSCB and TNHB (indicated earlier in this section) are by no means small. It is true the emphasis is on housing and basic civic amenities but these have certainly improved the living conditions of the poor to a large extent. The multi-storeyed tenements, tiled roofs of individual shelter units, paved roads with street lights, water tanks and standposts for water supply have all certainly changed the scenario of the slum settlements in Madras and other cities of Tamil Nadu. In fact the multistoreyed tenements and the areas improved under MUDP I & II are really non-slums.

8.21 The Sites and Services developed by TNEB have provided shelters in well planned environment to a large number of urban poor living both in slums and other overcrowded areas of the city.

TABLE 8.2

SLUM IMPROVEMENT PROGRAMMES IN TAMIL NADU

PROGRAMME	OBJECTIVE
1. Slum Clearance Scheme (Prior to 1971)	Clearing of huts and provision of tenements in multi-storeyed building on rental or hire purchase basis (49,180).
2. Environmental Improvement Scheme/Accelerated Slum Improvement Scheme (1972-73)	Provision of common facilities in the slum areas - public baths & F.O.L., public fountains and street lights (1,44,272).
3. Slum Improvement under Madras Urban Development Projects I & II (1977-78)	Provision of public baths, toilets, fountains, street lights, pre-primary and high schools and cottage industries (85,140). Issuance of land ownership (patta) and grant/loan for construction of house (HIL) (42,547).

TABLE 8.2 (Contd..)

PROGRAMME	OBJECTIVE
	Off site-construction of feeder and arterial drains to relieve stagnation and innundation of low lying areas during floods.
4. Slum Improvement under G.O.I. Incentive Schemes (1983-84)	Improvement works in the slum areas of selected municipalities (6,865).
5. Shelter for Shelterless (1986-87)	Provision of shelter for slum families adopting low cost techniques either on rental or hire purchase basis (2,010).
6. Mass Housing Programme (1986-87)	Provision of infrastructural facilities like water supply, sewerage connections and street lights (97,650).
	Grant for conversion of thatched roof to tiled roof or mud walls to brick walls (1,42,657).
	Cash loan for upgradation of shelters (134).
7. Urban Community Development Programme	Provision of health care centres, mother and child care under ICDS, adult education, training in productive skills for the unemployed, loans for self-employment under DRI and SEPUP.
8. Sites and Services (Implemented by TNHB)	Provision of developed plots. (30,000).

* Figures in brackets indicate year of commencement of the programme and number of families benefited upto March 1989.

** Most of the beneficiaries, except under item 6, are in Madras City.

8.22 A profile of the slum population in Madras City is presented in Table 8.3 with the help of the data obtained through two different socio-economic surveys carried out by the Tamil Nadu Slum Clearance Board in 1972 and the Economist Group in 1986.

**TABLE 8.3
PROFILE OF SLUM POPULATION IN MADRAS CITY**

	TNSCB SURVEY 1972	EG SURVEY 1986
Total population	24,69,449	37,18,347
Slum population	7,37,531	6,50,860
Slum population, % to total population	34	18
Slum families	1,63,804	1,27,181
Family size	4.5	5.1
Literacy	42	65
Employed, % to total work force	48	68
Earner per family	1.2	1.6
Monthly family Income, Rs.	490	679
Monthly per capita Income, Rs.	109	133

(1) The EG survey slum population excludes 5.8 lakh persons covered under Tenements and Site & Services Schemes of the TNSCB which are treated as non-slum areas.

(2) The income figures of 1972 are duly adjusted for price effect.

8.23 The 1986 profile is a clear indicator of the benefits accrued to the slum population in the city over the years. Though it may not be possible to attribute the impact exclusively to any specific programme, agency or action, much of the credit should go to the Tamil Nadu Slum Clearance Board and other development agencies associated with it in implementing a package of schemes during the period for the integrated development of the slum areas.

8.24 Changes in the economic status of the urban poor does not depend only on programmes exclusively designed for the target population. The overall development of the economy in the region plays a key role in tackling the issue. Direct assistance programmes aimed at increasing the incomes of the poor through employment and self-employment can at best help in reducing inequalities in the short run. It is essential to sustain the economic activities generated under these schemes and use them as a catalyst for future growth.

POLLUTION

8.25 Tanneries in Periyar, North Arcot, Coimbatore, Trichy, Chingleput, Madras and Anna districts, distilleries, cement industry, photo films in Ooty, mercury pollution in caustic soda production in Chidambaranar district, Manali etc. are some of the more important sources of industrial pollution (Pollution Control Board, Madras). These have attracted the attention of the authorities but there is other pollution resulting from inappropriate disposal of sewerage water etc. Presence of flourine, chromium, lead etc. in the effluents from industries can affect the health of the population. Presence of these chemicals even in underground water either naturally or due to pollution can lead to similar problem as has been discussed in case of fluorosis.

8.26 Pollution of air in urban areas due to thermal power stations, large number of automobiles etc. causing presence of carbon monoxide, lead, hydrocarbons etc. in the air has been responsible for respiratory ailments. Noise pollution from forge shops, spinning mills, aircrafts, automobiles, etc. has been identified, but the need for controls in these areas is yet to be widely recognised. Blaring of film music through loud speakers on festive occasions is a very common practice in the State.

ADULTERATION OF FOOD ARTICLES

8.27 Government, through their Public Health Department, exercise control on quality of food articles being sold through provision stores and provisions used and hygiene in preparing food in hotels. Though a large number of food samples—20,040—were analysed in 1987 and 1456 cases were taken up for prosecution, the situation is far from satisfactory (Performance Budget, Public Health, 1989-90). Food articles are prepared in hotels under unhygienic conditions. The problems become very acute at times of water shortages or in fairs and festivals. Adulteration of cereals and pulses with stones of the same shape and colour, and use of toxic colours or substitution of look-alike harmful materials are frequent in spite of all the regulatory measures.

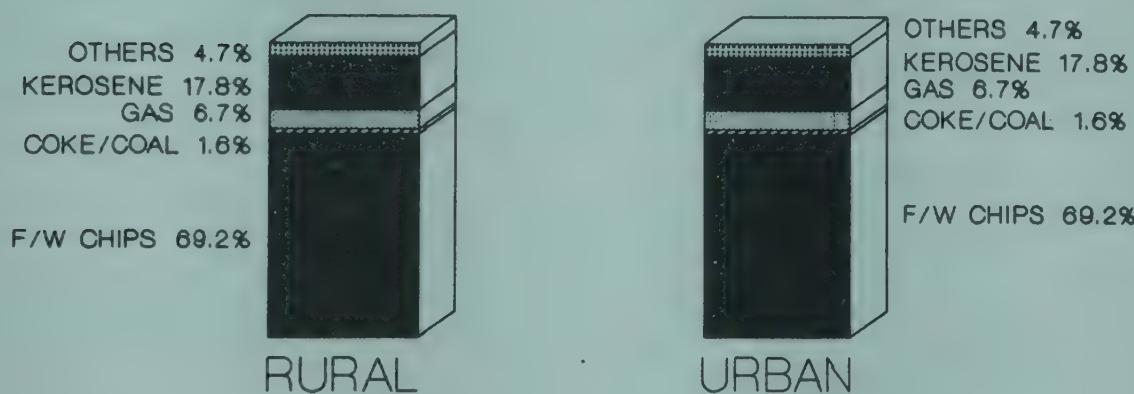
DEFORESTATION

8.28 The forest wealth of the country has been depleting at a very fast rate consequent to urbanisation and indiscriminate felling of trees for various end uses. Changes in weather and depletion of ozone layer have drawn the attention of the environmentalists and public alike. Protection of forest resources is one of the declared objectives of the States.

8.29 Inspit of all the controls on felling of trees, 97% of rural households and 70% of urban households still depend on firewood for cooking. This is because of the availability of wood in rural areas and wood still being the cheapest fuel in the urban areas. Exhibit 8.3 illustrates the use of different fuels in rural and urban households for cooking. However, in recent years there has been shortage of firewood which has a direct impact on the nutritional status of the population.

EXHIBIT 8.3

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY PRIMARY SOURCE OF ENERGY FOR COOKING



SOURCE: 38th ROUND,N.S.S.,T.N.,1983

8.30 For protecting the environment and forests it is essential that alternate cheaper energy sources for cooking and alternate material for construction and other uses are identified. Developing the use of solar energy for cooking will go a long way in making cheaper alternative fuel available to the masses.

9. Perspectives

9.1 On examining various facets that affect the life of children in Tamilnadu, certain important issues have emerged that need to be looked at on a priority basis. These are:

- The vicious cycle of malnutrition among children, pregnant and lactating mothers, resulting in pregnancy complications, low birth weight infants and consequent high infant mortality.
- The sharp rural, urban divide in terms of basic facilities like hospitals, educational institutions, sanitation etc.
- The large pockets of child labourers in the State. The conditions of work and basic health of these children are a cause for concern.
- The retention level of the educational system is rather low—only 52% at the middle school level.

9.2 It is however heartening to note that 'children' as a group (16 million today out of a total population of 55 million and likely to remain constant at that figure) are coming sharply into the focus of policy makers in Tamilnadu. This is evidenced by several targeted schemes both at the State and the national level eg.,

- The Tamil Nadu Govt. Nutritious Noon Meal Programme
- The Tamil Nadu Integrated Nutrition Programme (TINP)
- The Centrally sponsored Integrated Child Development Services Programme (ICDS)
- Universal Immunisation Programme.

9.3 While some headway has been made in all areas concerning children, it appears that the subject of nutrition has rightfully gained the top spot. This accent appears to be continuing in the planning exercises for the future. This policy thrust is based on the premise that action concerning children should be immediate and direct and cannot wait for other developmental processes to take place.

9.4 Given the existing thrust it appears that the situation of the nutritionally vulnerable sections, specially children and pregnant and lactating mothers is likely to improve from the present situation of:

- a 30-40% calorie deficiency among children of all age groups.
- Protein deficiency among adolescents, aggravated by worm infestation.
- Nutritional and Iron deficiency anaemia among pre-school children and girls who have reached the age of menarche
- High Vitamin A deficiency.

9.5 However, there are certain priority areas which continue to need special attention:

- Vitamin 'B' deficiency which has not been tackled adequately by any programme
- "Exclusions" or omissions from social welfare schemes like the children employed in

the Sivakasi match belt who for various reasons are excluded from the purview of the Noon Meals Scheme.

Nutritional education which could include aspects like; a mixed diet (both rice and wheat); consumption of coarse cereals and locally available fruit and vegetables, removal of food taboos, etc.

9.6 Some of these issues would be tackled by the second phase of the Integrated Nutrition Programme which the State Govt. has launched. Communication and training of field staff and community representatives will form a major part of TINP Phase II to be implemented at a cost of Rs.350 crores over the next 5 years. Phase II of the project has drawn upon the experiences in Phase I which have shown than that the major constraints in improving the nutritional status of the children were traditional beliefs and practices, prejudices and lack of sound nutrition practices.

9.7 The distinction between health and nutrition is at best artificial since the inter-linkages are far too many. Malnutrition aggravates common childhood illnesses and weakens the overall condition of the child. Some basic issues that loom up are:

- (1) Infant Mortality in the State remains high at 75 per thousand live births, the problem being more acute in the rural areas.
- (2) The health infrastructure has recognised this problem and has initiated the two pronged task of
 - training 'dais' who are the village obstetricians in hygienic delivery practices
 - simultaneously ensuring that pregnant women who are suffering from malnutrition are given priority through select intervention programmes.

9.8 On the positive side "post natal" and under-5 mortality is declining due to the increased importance being given by the State to immunization. Deaths due to neo-natal tetanus have almost been removed, while the progress on DPT is also laudable. "Operation Polio" launched in the State in 1988 aims at complete eradication of polio through immunisation and rehabilitation of the victims. Measles remains one area where the progress to date has not been satisfactory due to a combination of cultural factors and non availability of vaccines. However the State proposes to tackle this on a district by district basis.

9.9 Any discussion on Tamilnadu is incomplete if one does not look at neighbouring Kerala as well, since certain districts adjoining Kerala eg. Kanyakumari district in Tamil Nadu present a picture quite different from the rest of the State. All the measures of socio-economic progress like the birth rate, the death rate, the infant mortality rate etc. are significantly better in Kerala. Is there a lesson here that can be learnt or transplanted easily? In this context, non formal methods of education, vocational education, and the dissemination of basic education through mass media like the television could be viable options. The recent campaign in Kerala to achieve total literacy is a model in itself. The target is ambitious as it covers those in the age group 6-60 and aims at sustaining the interest of the new learners through linkages with developmental and welfare activities. Another interesting facet is that there is an ethos of equal partnership between the government and the local agencies involved (ranging from fisherman's associations, the police and other professional bodies).

It appears that literacy especially female literacy is the key to many of these issues. This has attracted the attention of the State Govt. and TN spends around Rs.900 crores p.a. on education. The emphasis of the State has been on primary education. Enrolment at the primary stage is very high at over 100%. However, since the wastages in the system are substantial at the middle and senior school level, it is a moot point as to whether the benefits of education and learning perpetuate.

RURAL/URBAN DISTINCTIONS

9.10 While the State is highly urbanized, the majority of its population is rural and will continue to remain so. The conditions of the bulk of the rural folk continue to be poor in terms of access to health facilities, basic nutrition, education etc. In this context it is difficult to isolate the child from the rest of the family. The rural population deserves special attention. This is clear from the following:

- health infrastructure in the rural areas remains inadequate (over 90% of all hospital beds are in the urban areas)
- almost 50% of all rural births are attended to by untrained dais or relatives at home.

The urban poor namely the slum population also merits special continuing attention. It is estimated that over 17% of the population of the 5 major urban centres of (Madras, Madurai, Salem, Coimbatore and Trichy) constitute slums.

It cannot be denied that the bulk of all social welfare schemes are funded and implemented by the Govt. (State/Centre). In this context an area of concern is the interrelationship/ coordination of various arms of policy making (MCH programmes, Nutrition programmes etc.) It is particularly important that the health and nutrition sectors work in tandem.

ENVIRONMENT

9.11 The environment has obviously a direct bearing on the well being of children. The poor quality of the physical environment affects children directly by increasing the incidence of diseases like diarrhoea, acute respiratory infection, malaria, typhoid and cholera. Respiratory infections which normally originate from a simple cold account for almost 50% of all childhood diseases. While the campaign against diarrhoea is active, respiratory infections need to be tackled on the same footing. TB is another major health hazard in TN. This manifests itself in children in the form of a primary complex. The incidence of TB appears to be on the increase.

Providing potable water is a major concern of the State. Water scarcity is endemic to the State with the majority of the rural households depending upon wells/borewells for their daily requirements of water.

In Tamil Nadu most rural and urban households continue to depend upon primitive forms of drainage and sewerage disposal. An interesting experiment in low cost sanitation has been tried out in Periyar district. This programme in which the rural household participates both financially as well as in terms of labour has used simple/relevant technology in providing easy methods of sewage disposal and sanitation in the district.

Considerable attention is being paid to this area with international funding as well as inter

state agreements taking shape on sharing of waters. Considerable attention is also being paid to ground water and minimising losses through surface evaporation. These are likely to have a long term bearing on the health of children.

CHILD LABOUR

9.12 Tamil Nadu has the second largest workforce of children when compared to the other states of India. This is largely a rural phenomenon with organised industries like the match industry, beedi, and the handloom/hosiery industry employing children on a regular basis. These working children are singularly underprivileged, since even the basic welfare schemes of the Govt. do not reach them, like the supplementary feeding programmes, health check-up schemes etc. This is because the delivery systems are largely based on the basic school infrastructure and these children obviously do not attend school. This is an area of great importance and a community based approach needs to be considered.

DISABLED AND DESTITUTE CHILDREN

9.13 Another pocket of specially deprived children are the disabled and the destitute. Disability prevention needs to be a multi-disciplinary and multi-sectoral endeavour involving the sectors of nutrition, health, education, employment and social and child welfare. An effort to prevent disability will be an appropriate and accelerated extension of the activities in these sectors.

9.14 While some services for the disabled exist in the voluntary sector, with or without government support, the coverage of these is inadequate to meet the needs of the large number of disabled children or adults. The existing rehabilitation services are limited in number and mostly in the urban areas.

9.15 As far as destitute children are concerned there is an urgent need to:

- (1) Assess the magnitude of the problem and reach out to children who are deprived of family support.
- (2) Develop a comprehensive development plan for these children.
- (3) Extend the basic welfare services like nutrition, education, recreation, health and vocational training to these children.

SOCIAL ISSUES

9.16 While targeted programmes would go a long way in improving the overall status of vulnerable sections there are certain pockets in Tamil Nadu where deep rooted beliefs, localised practices like female infanticide, teenage marriages etc. are prevalent. These need to be tackled on a community to community basis preferably with the aid of localised voluntary agencies.

CONCLUSION

9.17 Designing and implementing programmes that look at mass behavioural change is difficult and challenging. Some of the critical challenges facing planners and implementers in Tamilnadu are:

- To be able to take different perspectives based on the issues themselves ie.

- a state wide view where the general population needs to be tackled e.g. on immunization and improvement of rural health infrastructure.
- an "area based" approach where the problems are specific like female infanticide or fluorosis.
- Ensuring mechanisms of coordination between the host of grassroots level workers, community nutrition workers, village dais, anganwadi workers, multi-purpose health workers, volunteer groups etc. This is a crucial intervention since focussed tasks will improve service delivery to a large extent by removing unnecessary duplication.
- While special efforts are under way to tackle the "under threes" which is the highest risk group, the sustainability of these interventions as the child enters the teens is to be looked at. A special mention should be made here of the adolescent girl. The benefits of adequate nutrition should reach her if the vicious circle of malnourished mothers, low birth weight infants and high infant mortality is to be broken.
- Again, education, especially, of the female in non-conventional ways is an area that is likely to be sustainable in the long run.

9.18 In conclusion it may be said that a coordinated effort in integrating various institutions and objectives would go a long way in strengthening the cause of the underprivileged child in Tamil Nadu.

TABLES

	Page
1.1 Urban population estimates	... 4
1.2 Rural and Urban growth rates 1971-1981	... 4
1.3 Distribution of population by religion	... 6
1.4 Sex ratio in the districts, Tamil Nadu and in India 1981	... 7
1.5 Distribution of work force by sectors	... 10
1.6 Reported child labour in Tamil Nadu 1961, 1971 and 1981	... 11
1.7 Percentage of literates	... 11
1.8 Production pattern for major crops	... 14
2.1 Health Indicators-a comparative profile	... 17
2.2 Per Capita (Govt.) expenditure on health	... 20
2.3 Distribution of hospital facilities	... 21
2.4 Distribution of hospital facilities ownershipwise	... 21
2.5 Dispensaries and beds according to rural/urban and ownership as on 1-1-88	... 21
2.6 Registered medical and paramedical personnel interactive list as on 31.3.88	... 22
2.7 Health Care for children, pregnant women and lactating mothers	... 23
2.8 Mortality rates in ICDS areas	... 28
2.9 Goals and achievements of health parameters	... 35
2.10 Special schemes under family welfare	... 35
2.11 National schemes for control of diseases	... 36
3.1 Health indicators—A comparative profile—1986	... 38
3.2 Components of infant mortality	... 42
3.3 Components of perinatal mortality	... 44
3.4 Specific causes of neo-natal deaths 1988	... 46
3.5 Causes for maternal mortality	... 49
3.6 Evolution of immunisation programme in India	... 57
3.7 Estimated number of beneficiaries and coverage under the UIP programme 1989-91	... 58
3.8 Cause of mortality among children	... 63
3.9 Causes of morbidity and mortality among children	... 63
3.10 Causes of morbidity among children	... 64
3.11 Causes of morbidity among children (0-5 years)	... 64
3.12 Prevalence of leprosy	... 70

	Page
3.13 Annual school survey analysis 1981-87	... 71
4.1 Average daily intake of foods	... 81
4.2 Calorie and nutrient adequacy of diets -1982	... 82
4.3 Energy status of pre-school children in relation to adults -All India	... 84
4.4 Knowledge and awareness among pregnant and lactating mothers	... 85
4.5 Prevalence of clinical signs of malnutrition among rural children-1982	... 89
4.6 Prevalence of clinical signs of malnutrition among urban children-1979	... 90
4.7 Scope and coverage of supplementary feeding programs in Tamil Nadu	... 92
4.8 Incidence of low birth weight	... 98
4.9 Prevalence of xerophthalmia in pre-school children	... 103
4.10 Trends in prevalence rate of xerophthalmia in pre-school children	... 104
4.11 KAP regarding key components of TINP	... 109
5.1 Adult Education programmes in Tamil Nadu	... 117
5.2 Basic facilities in schools	... 126
6.1 Health hazards of working children	... 136
7.1 Prevalence rates in children (per 100,000 population within that particular age group)	... 139
8.1 Percentage distribution of households by type of latrines used	... 151
8.2 Slum improvement programmes in Tamil Nadu	... 154
8.3 Profile of slum population in Madras City	... 155

EXHIBITS

	Page
1.1 Rainfall in Tamil Nadu	3
1.2 Shatial Distribution	3
1.3 Average Annual Temperature	3
1.4 Distribution of Population	3
1.5 Growth of urban population	4
1.6 Birth rates in Tamil Nadu	
Birth rates in India	5
1.7 Death rates in Tamil Nadu1970-87	
Death rates in India 1970-87	5
1.8 Sex ratio in Tamil Nadu	
Sex ratio in India	7
1.9 Age distribution of population	8
1.10 Percentage of population	8
1.11 Dependency ratios in Tamil Nadu	9
1.12 Economy of Tamil Nadu	12
1.13 Net domestic product	13
1.14 Growth in per capita income—Tamil Nadu and India	13
2.1 Organisation Structure—Health Services	18
2.2 Health Care Service System	20
2.3 Nutritional status of children in ICDS areas	27
2.4 Nutritional status of children in ICDS project areas	27
2.5 Improvement in nutritional status of children in TINP areas	30
2.6 Nutritional status of children in TINP areas	30
2.7 Prevalence of clinical signs of malnutrition in TINP areas	31
2.8 Infant mortality rates in TINP areas	31
3.1 Age specific death rates in Tamil Nadu	38
3.2 Trends in death rates among children (0.5 years)	39
3.3 Infant mortality in Tamil Nadu 1970-87	40
3.4 Infant mortality by sex in Tamil Nadu	41
3.5 Relative trends in infant and neo-natal mortality rates	42
3.6 Relative trends in early and late neo-natal mortality	43
3.7 Still Birth rate 1980-86	44
3.8 Perinatal mortality rate 1980-86	46
3.9 Perinatal mortality in relation to birth weight	47

	Page
3.10 Perinatal mortality in relation to maternal age	51
3.11 Perinatal mortality in relation to parity	51
3.12 Percent distribution of sample births by type of medical attention at birth	54
3.13 Percent distribution of sample deaths by type of medical attention before birth	54
3.14 Post neo-natal mortality rate 1980-86	56
3.15 State level coordination committee under the Chairmanship of Chief Secretary	60
3.16 Cold chain	61
3.17 Polio	67
3.18 Tuberculosis in children in Tamil Nadu	68
3.19 Tetanus in Tamil Nadu	69
3.20 Diphtheria and Whooping Cough	69
3.21 Measles	70
3.22 Mortality Rates of Children in 5-9 and 10-14 years	73
4.1 Trends in consumer expenditure Tamil Nadu-Urban	75
4.2 Trends in consumer expenditure Tamil Nadu-Rural	75
4.3 Trends in consumption of foodgrains	75
4.4 Per capita production and availability of foodgrains	77
4.5 Production of milk, eggs, meat and fish	78
4.6 Per capita availability of sources of animal proteins	78
4.7 Consumption pattern for milk-Urban	79
4.8 Consumption pattern for fish—Tamil Nadu-Urban	79
4.9 Pattern for cereal consumption	80
4.10 Calorie and nutrient deficiency-Children	85
4.11 Calorie and nutrient deficiency-Pregnant and lactating mothers	86
4.12 Nutritional status of children—Tamil Nadu-Urban	87
4.13 Nutritional status of children—Tamil Nadu-Rural	87
4.14 Nutritional status of children in TINP areas	94
4.15 Nutritional status of children in ICDS project areas	95
4.16 Nutritional status of children in ICDS areas	95
4.17 Distribution of rural children—Waterlow's classification	96
4.18 Incidence of low birth weight in TINP project areas	98
4.19 Maternal height and pregnancy outcome	99
4.20 Maternal malnutrition and pregnancy outcome	99

	Page	
4.21	Maternal haemoglobin status and pregnancy outcome	99
4.22	Breast feeding practices-Tamil Nadu	100
4.23	Growth status of Infants-by feeding practices	101
4.24	Coverage of Vitamin A Prophylaxis programme	104
4.25	Prevalence of Iron deficiency Anaemia-Pre school children (0-5 years)	106
4.26	Prevalence of Iron deficiency Anaemia-Ante and post natal women	106
4.27	Prevalence of Iron deficiency Anaemia - Women in child bearing age group	106
4.28	Coverage under the Government Programme for preventing Anaemia–Pregnant Women	107
4.29	Coverage under the Government Programme for preventing Anaemia-Children	108
5.1	Literacy rates in India	110
5.2	Progress of literacy in Tamil Nadu	111
5.3	Progress of literacy in India	111
5.4	Government expenditure on education in Tamil Nadu	112
5.5	Percentage of literates among the population	113
5.6	Literacy rates among specific groups—Tamil Nadu	113
5.7	Gross Enrolment ratios among various groups 1987-88	114
5.8	Drop out rates in Tamil Nadu (1987-88)	114
5.9	Female literacy and infant mortality in South East Asia-A correlation	115
5.10	Child mortality estimates (All India)-by education status of mothers	116
5.11	Distribution of schools—Urban/Rural	118
5.12	Distribution of schools—Urban/Rural	118
5.13	School Education system in Tamil Nadu	119
5.14	Classification of schools by management	120
5.15	Classification of schools by management-High School and Higher Secondary	120
5.16	Gross Enrolment ratios -Tamil Nadu	121
5.17	Trends in gross enrolment ratios	121
5.18	Census estimates of percentage of children attending school	122
5.19	Drop out rates in Tamil Nadu	123
5.20	Trends in drop out rates	123
5.21	Pupil Teacher ratio	125
5.22	Reach of school facilities	125

	Page
5.23 Classification of primary schools-by adequacy of basic facilities	126
6.1 Work participation among children - Tamil Nadu	129
6.2 Work participation among children-5-9 years and 10-14 years	130
7.1 Causes of disability - Visual Speech Hearing and Locomotor	140
7.2 Literacy status of the disabled - All India	141
7.3 Work participation among the disabled -All India	141
7.4 Literacy status and work participation among visually disabled—All India	141
7.5 School Enrolment among physically disabled children—All India	142
8.1 Percentage distribution of households over primary sources of drinking water	149
8.2 Type of house	152
8.3 Percentage distribution of households by primary source of energy for cooking	157

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